2 × 500 SHEET

PAPER DECK-C1

SERVICE MANUAL

REVISION 0

Canon

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INTRODUCTION

This service manual provides basic information required in performing field service to maintain the product quality and functions of 2×500 Sheet Paper Deck-C1.

Each chapter consists of the following sections:

Chapter 1, “Introduction,” Specifications, Names of Parts.

Chapter 2, “Operation Overview,” Description of the mechanical and electrical operating principles and timing by function.

Chapter 3, “Mechanical System,” Description of mechanical structure, and disassembly, assembly and adjustment methods.

Chapter 4, “Maintenance and Inspection,” Table of periodic replacement parts and consumables replacement targets, periodic service list and parts to be cleaned during a customer service call.

Chapter 5, “Operation Failure Countermeasures,” Standards/ adjustments, operation failure countermeasures and delivery failure countermeasures.

“Appendices,” Signal name list, general circuit diagram, special tools, solvent and oil list.

Note that since installation procedure instructions are packed with the 2 × 500 Sheet Paper Deck-C1, no installation procedures are provided in this manual.

Changes of the contents made for the sake of product improvements will be notified in Service Information (Technical Information) whenever such changes are made.

Gaining a sound and thorough understanding of the copier through careful reading of this service manual and the subsequently issued Service Information (Technical Information) bulletins is the only way to develop the technical skill necessary to prolong product quality and functionality and the practical ability to be able to determine the cause of breakdowns.

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CHAPTER 1

INTRODUCTION

I. SPECIFICATIONS.....1-1
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I. SPECIFICATIONS

Item	Specifications
Type of paper feed paper	Plain paper, coloured paper, thick paper
Paper feed paper size Cassette 3 Cassette 4	 B4, A4, legal and letter size plain paper (64 g/m^2 to 105 g/m^2 recommended paper) A3, B4, A4, ledger, legal and letter size plain paper (64 g/m^2 to 105 g/m^2 recommended paper)
Cassette type Cassette 3 Cassette 4	 Universal (can be changed to B4, legal, letter and A4 size paper) Universal (can be changed to ledger, A3, B4, legal, letter and A4 size paper)
Cassette specifications	Depth: 50 mm (can contain up to 500 sheets of 64 g/m^2 paper)
Operating environment Temperature Humidity Atmospheric pressure	 10 to 32.5°C 20 to 80% RH 746 to 1013 hPa (560 to 760 mmHg)
Max. Power Consumption	Approx. 48.9 W or less (at a room temperature of 20°C and rated power supply voltage)
Noise (Official noise pollution value, as per ISO 9296)	Sound power level (1 dB = 10 dB) 7.1 dB or less (printing) 6.5 dB or less (stand-by) Sound pressure level 54 dB or less (printing) 49 dB or less (stand-by)
Dimensions	629 (W) × 520 (D) × 651 (H) mm
Weight	Approx. 30 kg
Power supply	100 to 120 V ±10% (50/60 Hz ±2 Hz) 200 to 240 V ±6% (50 Hz ±2 Hz)

Specifications are subject to change for the sake of product improvements.

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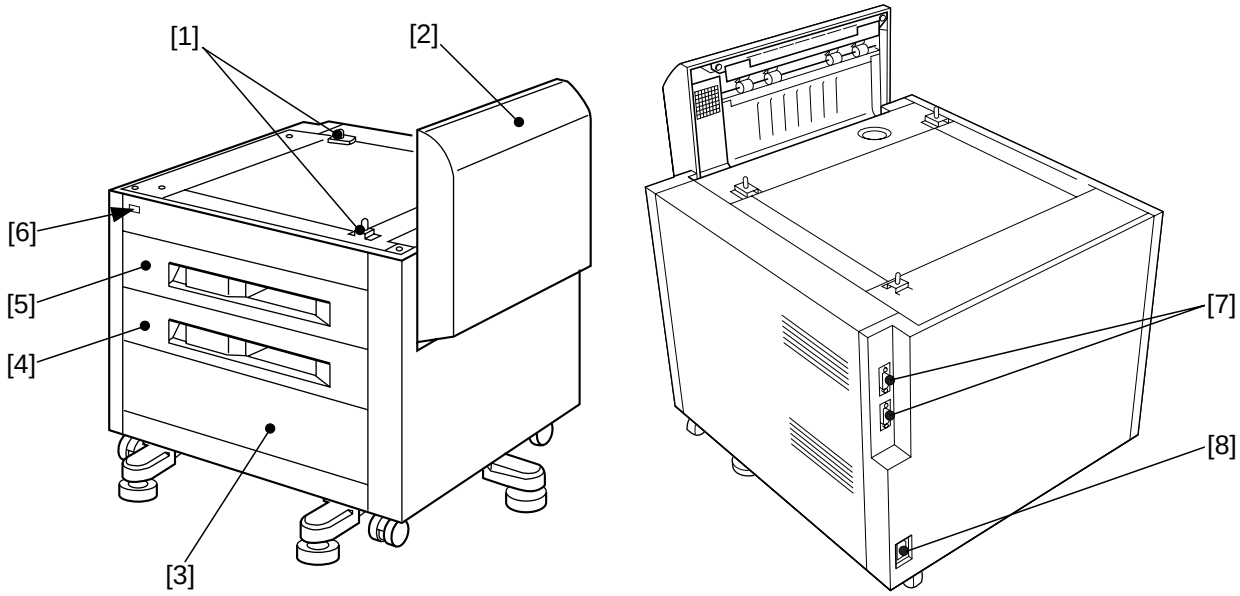
II. NAMES OF PARTS

A. External View



[1] Positioning pin
[2] Delivery assembly
[3] Storage space
[4] Cassette 4
[5] Cassette 3
[6] User LED
[7] Interface connector
[8] Power supply receptacle

Figure 1-201

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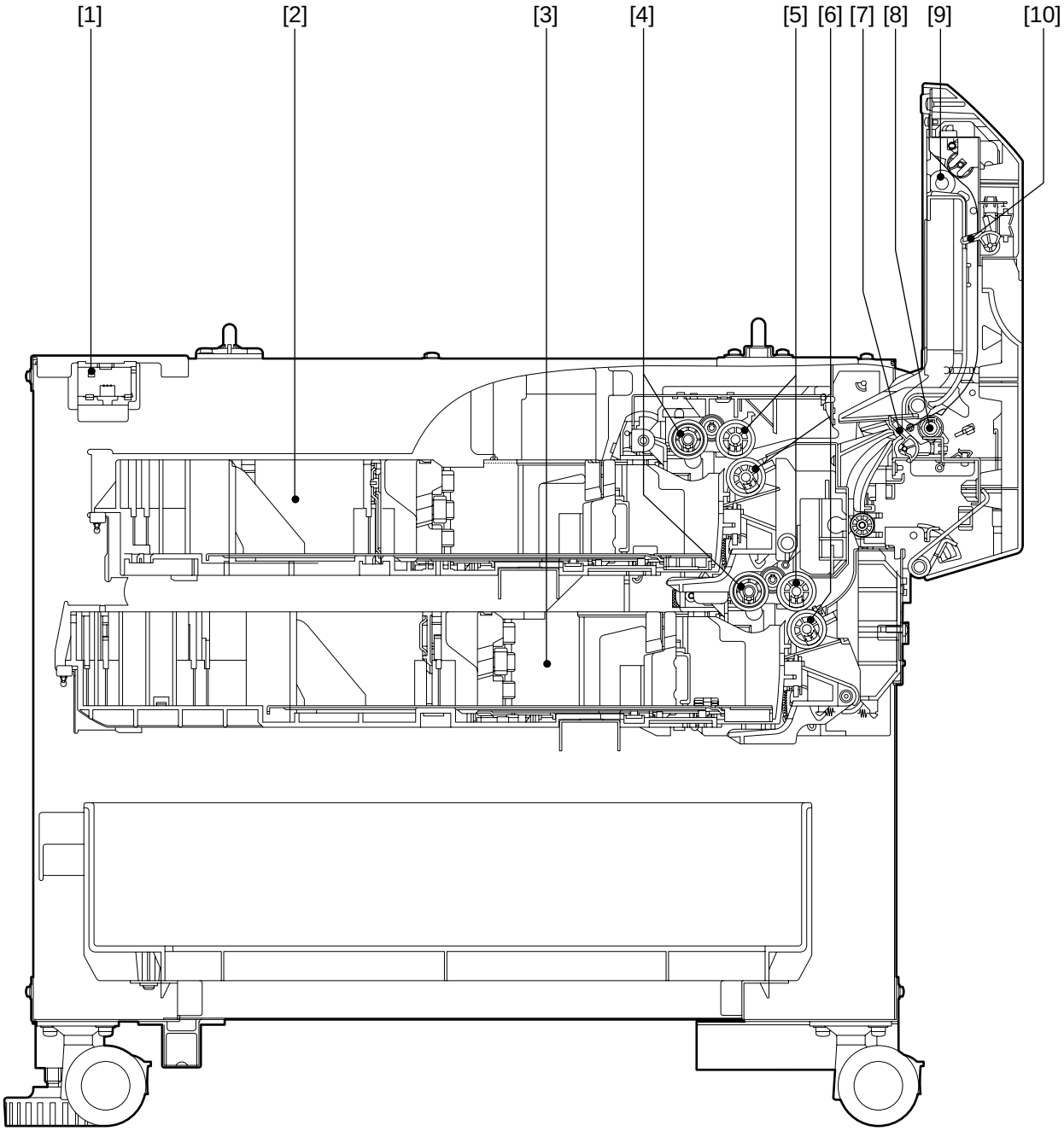
B. Cross-section Diagram



[1] User LED
[2] Cassette 3
[3] Cassette 4
[4] Paper feed roller
[5] Delivery roller 1
[6] Separation roller
[7] Registration paper sensor lever
[8] Registration roller
[9] Delivery roller 2
[10] Jam sensor lever

Figure 1-202

CHAPTER 2

OPERATION OVERVIEW

1. This chapter describes the objective and role of each function, the relationship between the electrical and mechanical systems and also gives an overview of the operation timing of each part by function.
   The ▮▮▮▮ symbol in the outline diagram indicates the transmission of mechanical drive, and the ⟶ symbol together with a signal name indicates the flow of electric signals.
2. In the descriptions of the digital circuits of the cassette feeding unit, "1" indicates a high electric signal level and "0" indicates a low electric signal level.
   The cassette feeding unit incorporates microprocessors, but as their internal operation cannot be checked, a description of microprocessor operation has been omitted.
   Since it is assumed that service engineers will not repair printed circuit boards on the customers' premises, descriptions of printed circuit boards are limited to overviews illustrated with block diagrams. Consequently, circuit descriptions cover from sensors to the input sections of the major printed circuit boards and from the output sections of the major printed circuit boards to the loads, as well as block diagrams of each function.

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I. BASIC CONFIGURATION

A. Overview

The unit transports the paper to the printer assembly.

The operation sequence of the unit is controlled by the paper deck driver PCB. This PCB incorporates an 8-bit microprocessor (IC201) that performs operation sequence control and control of serial communications with the option controller PCB.

The paper deck driver PCB drives solenoids, motors, etc. in response to commands transmitted from the option controller PCB, via serial communication lines. The paper deck driver PCB also notifies the option controller PCB of sensor and switch information, via the serial communication lines.

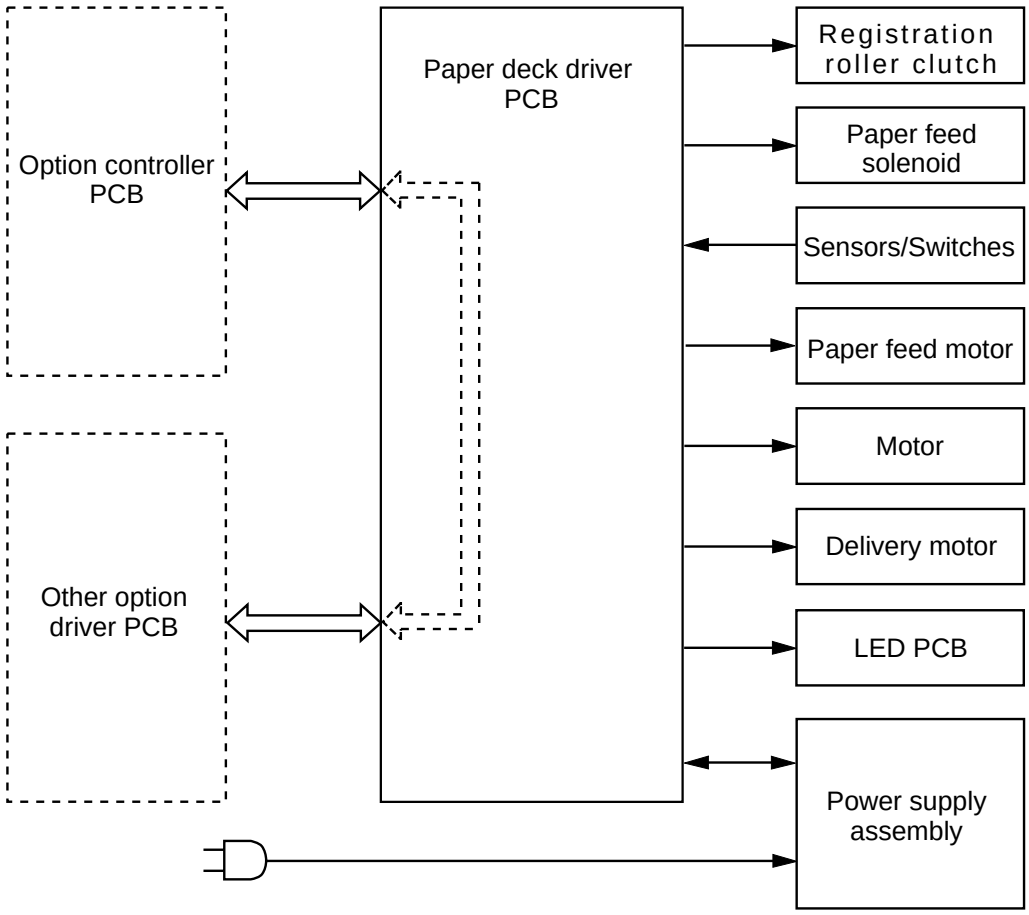

Figure 2-101

B. Inputs and outputs to the Paper Deck Driver PCB

Inputs and outputs to the Paper Deck Driver PCB (1/3)

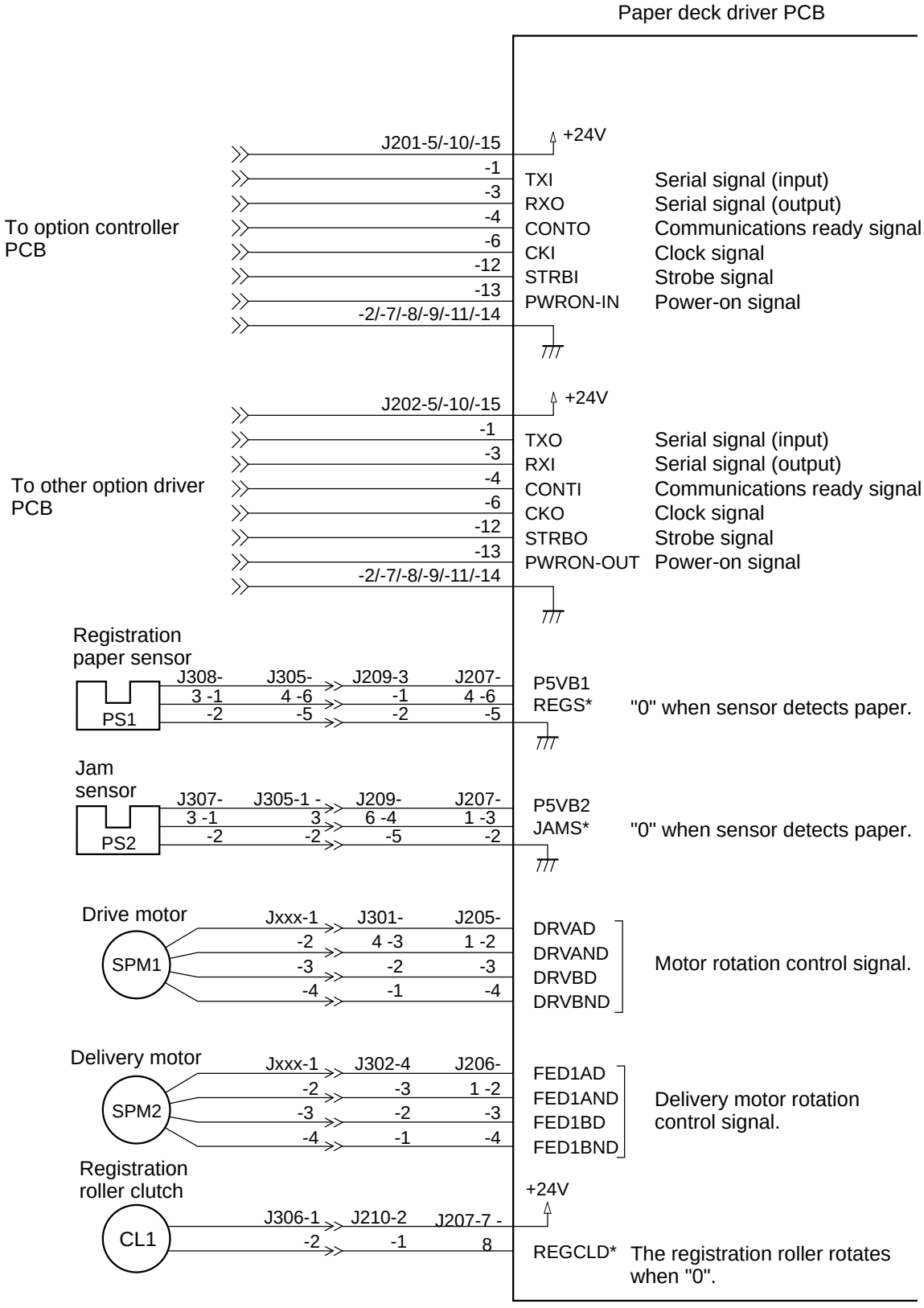

Figure 2-102

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Inputs and outputs to the Paper Deck Driver PCB (2/3)

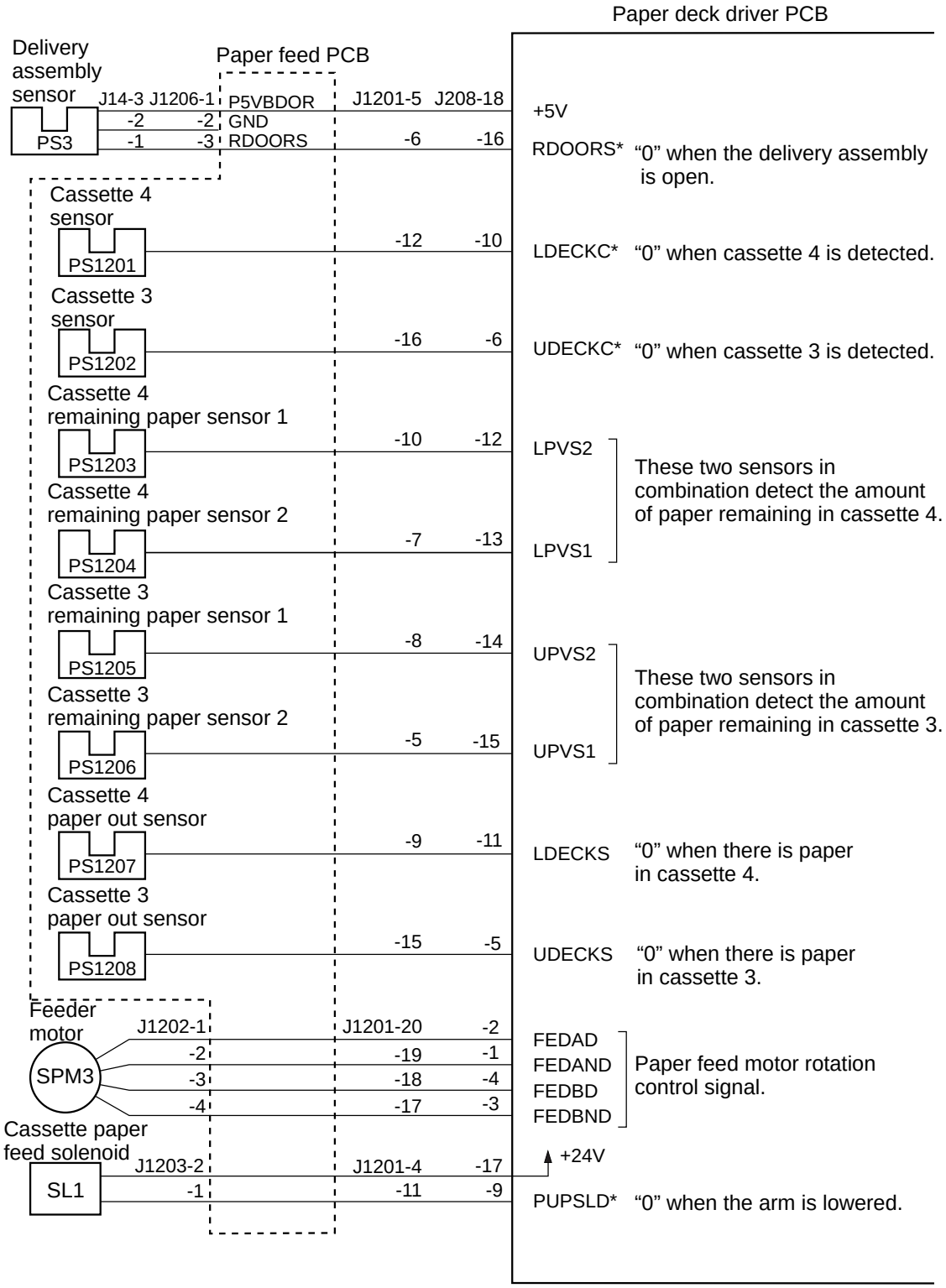

Figure 2-103

Inputs and outputs to the Paper Deck Driver PCB (3/3)

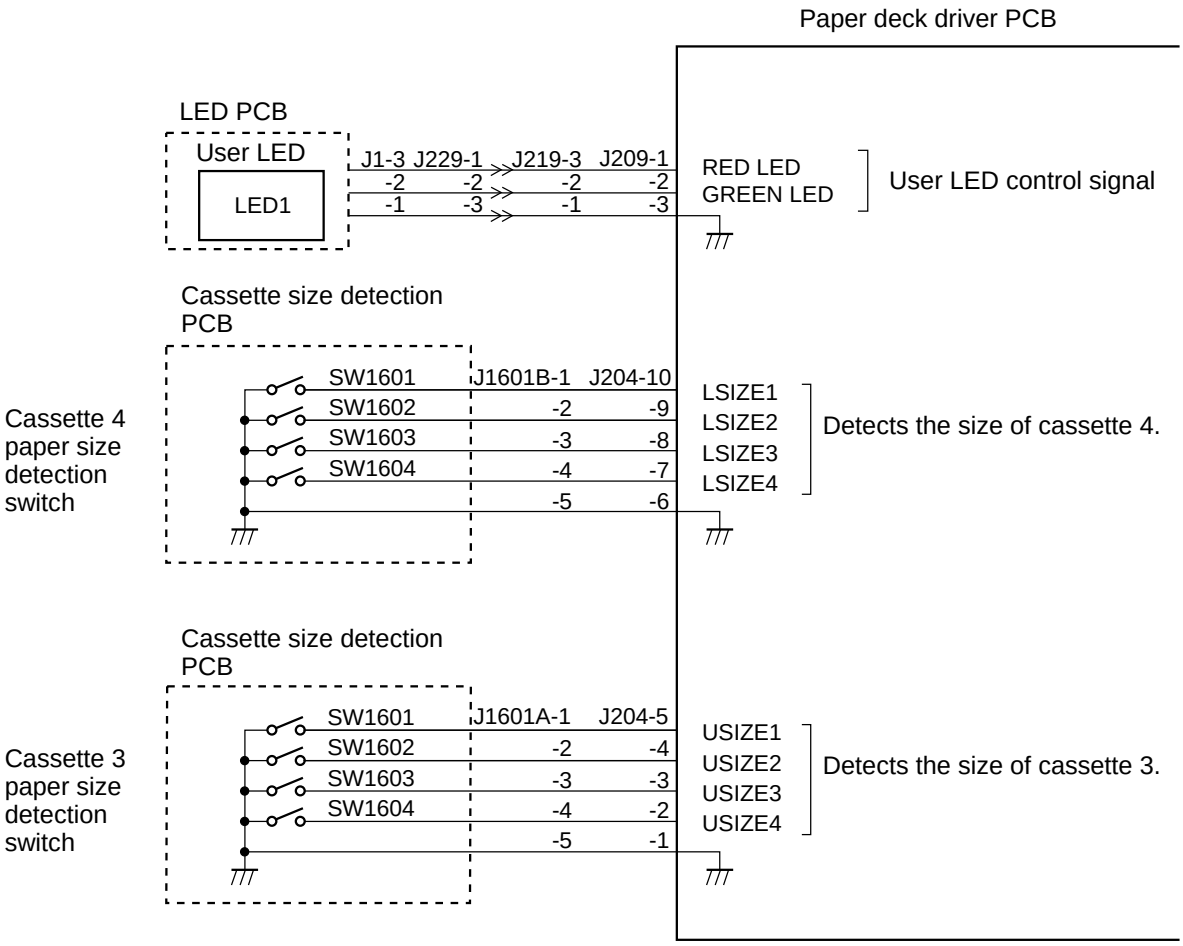

Figure 2-104

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II. PAPER FEED AND DELIVERY SYSTEM

A. Overview

The paper deck driver PCB starts the paper feed operation when it receives the paper feed command from the option controller PCB. Paper fed by the Pick up roller is transported to the feeder assembly by Pick up/feeding roller and the separation roller. The registration roller corrects any skew feed in the paper and then stops.

The paper deck driver PCB causes the paper feed motor (SPM3) to rotate. This causes the Pick up roller, Pick up/Feedig roller and the separation roller to turn.

At the same time, after the paper deck driver PCB causes the motor (SPM1) to rotate, the paper feed solenoid (SL1) is turned on. This lowers the Pick up roller to the surface of the paper. As a result, the rotating Pick up roller feeds the paper to the feeder assembly. The paper transported to the feeder assembly goes through the registration paper sensor (PS1) and stops temporarily when it reaches the registration roller. When the paper deck driver PCB subsequently receives the paper feed command it causes the paper feed motor (SPM3) and the delivery motor (SPM2) to turn. At the same time, the registration roller clutch (CL1) is turned on. This causes Pick up/feeding roller, the registration roller and delivery roller 2 to turn, and the paper is fed to the printer assembly.

There are two photo-interrupters (PS1 and PS2) in the delivery path that detect when the paper reaches the path, and when it goes through it.

The paper deck driver PCB assembly assumes that a paper jam has occurred when the paper does not reach or pass the sensors (in the paper feed path) within a specified time. It then stops operation and notifies the option controller PCB that a paper jam has occurred.

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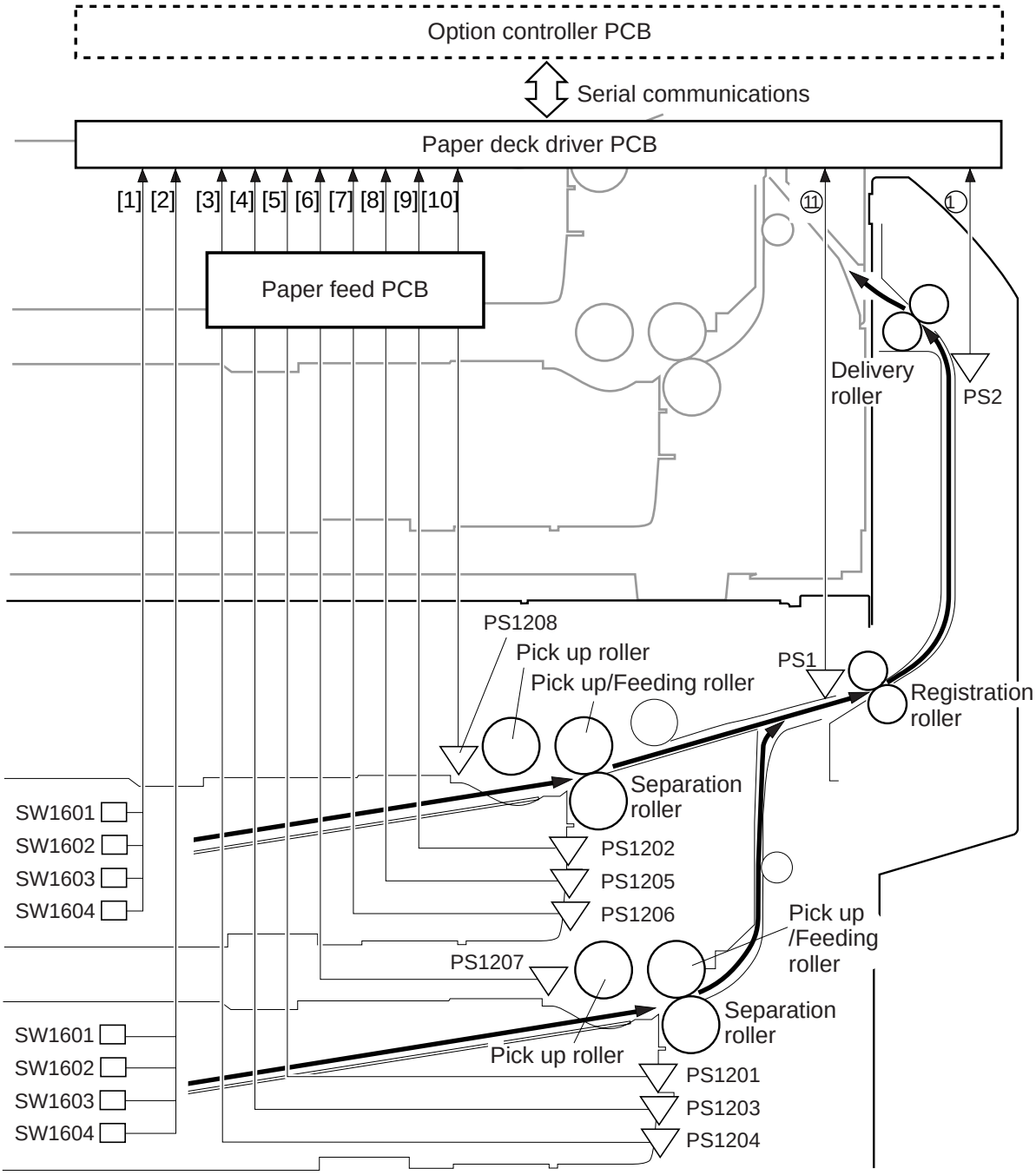

[1]: Cassette 3 paper size detection signal
[2]: Cassette 4 paper size detection signal
[3]: Cassette 4 remaining paper detection signal 1 (LPVS1)
[4]: Cassette 4 remaining paper detection signal 2 (LPVS2)
[5]: Cassette 4 detection signal (LDECKC*)
[6]: Cassette 4 paper out detection signal (LDECKS*)
[7]: Cassette 3 remaining paper detection signal 1 (UPSV1)
[8]: Cassette 3 remaining paper detection signal 2 (UPSV2)
[9]: Cassette 3 detection signal (UDECKC*)
[10]: Cassette 3 paper out detection signal (UDECKS*)
[11]: Registration paper detection signal (REGS*)
[12]: Multi-feed manual tray detection signal (MPTPS*)

PS1: Registration paper sensor
PS2: Jam sensor
PS1201: Cassette 4 sensor
PS1202: Cassette 3 sensor
PS1203: Cassette 4 remaining paper sensor 1
PS1204: Cassette 4 remaining paper sensor 2
PS1205: Cassette 3 remaining paper sensor 1
PS1206: Cassette 3 remaining paper sensor 2
PS1207: Cassette 4 paper out sensor
PS1208: Cassette 3 paper out sensor
PS1601: Cassette size detection switch
PS1601: Cassette size detection switch
PS1601: Cassette size detection switch
PS1601: Cassette size detection switch

Figure 2-201

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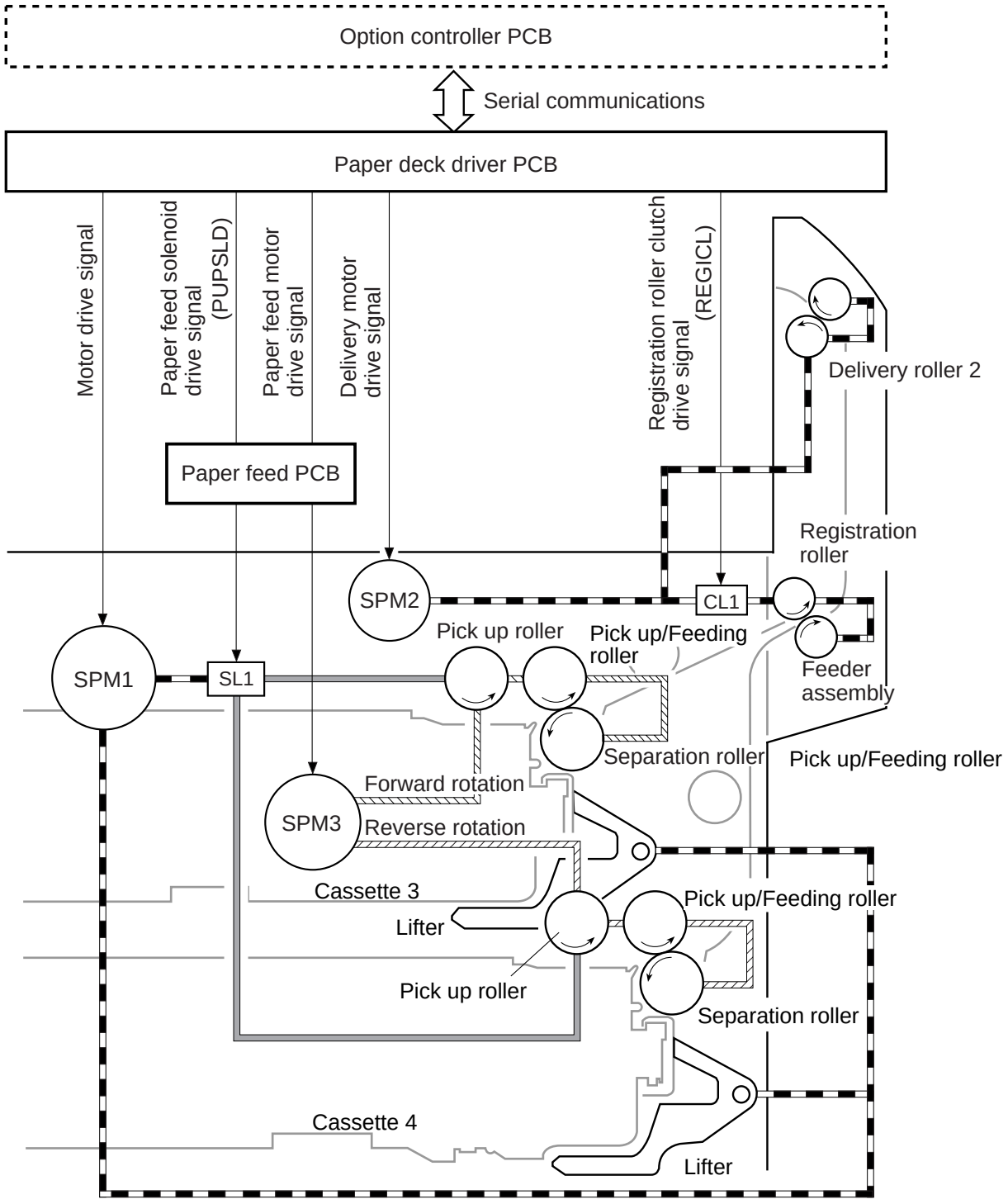

SPM1: Drive motor
SPM2: Delivery motor
SPM3: Paper feed motor
SL1: Paper feed solenoid
CL1: Registration roller clutch

Figure 2-202

B. Paper Feed, Delivery

1. Paper Feed Operation

The unit causes the lifter to raise the paper to the location where it can be fed, after which the rotating cassette Pick up roller is lowered to the paper surface to start paper feed.

Paper feed is only performed when the paper deck driver PCB receives a paper feed command from the option controller PCB. Then the paper deck motor (SPM1) causes the Pick up rollers to be lowered to the paper surface. At the same time, the drive motor causes the Pick up rollers to rotate.

The paper feed operation is described below.

The paper deck driver PCB causes the drive motor (SPM1) and the paper feed motor (SPM3) to rotate when it receives a paper feed command from the option controller PCB. When the cassette paper feed solenoid (SL1) goes on, drive from the paper deck motor is transmission via a gear to the cassette paper feed cam that drives the lifting arm. At the same time, drive motor drive is transmitted to the cassette Pick up roller via the delivery roller gears. The rotating cassette Pick up rollers are now lowered to the paper surface to feed one paper sheet after which the Pick up rollers are again raised to the position where paper can be fed.

When the paper feed motor is in forward rotation mode, the cassette 3 Pick up roller, delivery roller 1 and the separation roller rotate to feed paper from cassette 3. When it is in reverse rotation mode, drive is transmitted to the cassette 4 Pick up roller, Pick up/Feeding roller and the separation roller to feed paper from cassette 4.

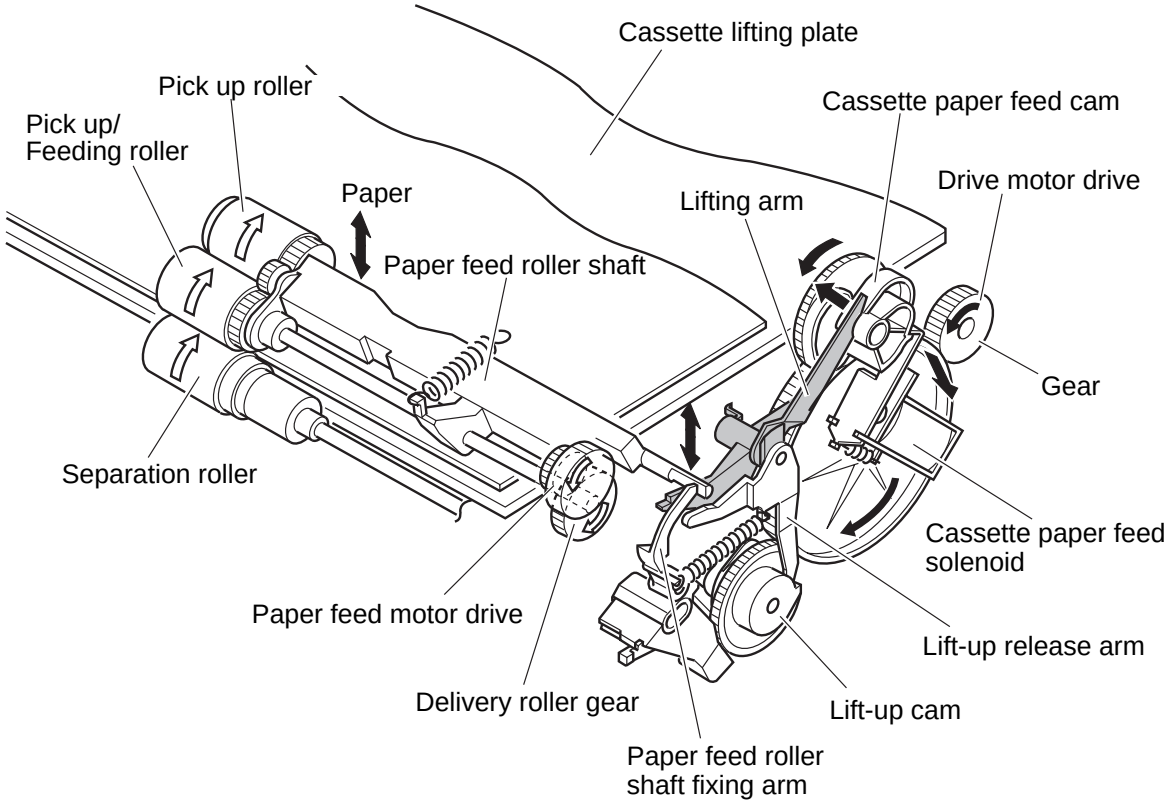

Figure 2-203

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2. Cassette detection, cassette size detection, remaining paper detection

Cassette 3 sensor (PS1202) and cassette 4 sensor (PS1201) detect whether or not cassette 3 and cassette 4 have been installed. Cassette 3 remaining paper sensor (PS1208) and cassette 4 remaining paper sensor (1207) detect whether or not any paper is left in the respective cassettes. Paper sizes are detected by the four detection switches (SW1601 to 1604) found both in cassette 3 and cassette 4. The combination of different cassette size detection switch states are shown in Table 2-201.

Paper size	Cassette Size Detection Switch			
	SW1601	SW1602	SW1603	SW1604
11 × 17	OFF	OFF	OFF	OFF
A3	OFF	ON	OFF	OFF
B4	ON	OFF	OFF	OFF
LGL	ON	ON	OFF	OFF
LTRR	OFF	OFF	OFF	ON
A4R	OFF	OFF	ON	OFF
A4	ON	OFF	OFF	ON
B5R	OFF	ON	OFF	ON
A5R	OFF	OFF	ON	ON

Table 2-201

The remaining number of paper sheets is detected by the position of the lifter that raises the paper. The lifter is equipped with a light shield. When the light shield interrupts light beam between the two sensors, the lifter position is detected and the remaining number of sheets is detected.

The remaining paper in cassette 3 is detected by the combined output of cassette 3 remaining paper sensor 1 (PS1205) and cassette 3 remaining paper sensor 2 (PS1206). Similarly, the remaining paper in cassette 4 is detected by the combined output of cassette 4 remaining paper sensor 1 (PS1203) and cassette 4 remaining paper sensor 2 (PS1204). The combinations of PS1205/PS1206 and PS1203/PS1204 states are shown in Figure 2-204.

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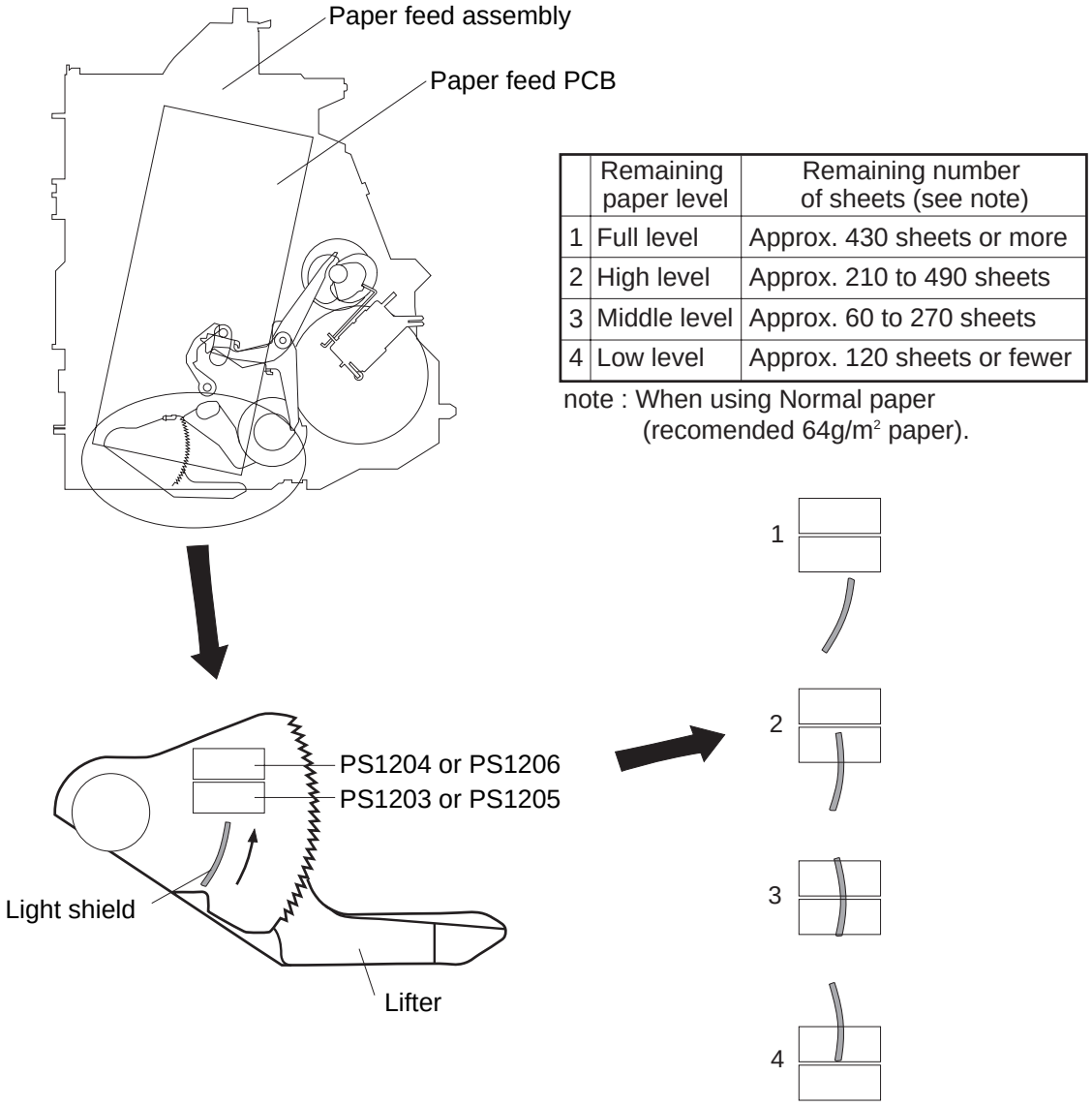

	Remaining paper level	Remaining number of sheets (see note)
1	Full level	Approx. 430 sheets or more
2	High level	Approx. 210 to 490 sheets
3	Middle level	Approx. 60 to 270 sheets
4	Low level	Approx. 120 sheets or fewer

note : When using Normal paper
(recomended 64g/m^2 paper).

Figure 2-204

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3. Lift-up operation

Lift-up operation is performed by the drive motor when a cassette is installed or when the paper surface has dropped so that the Pick up roller shaft is below a certain level.

The lift operation performed in both cases is illustrated below.

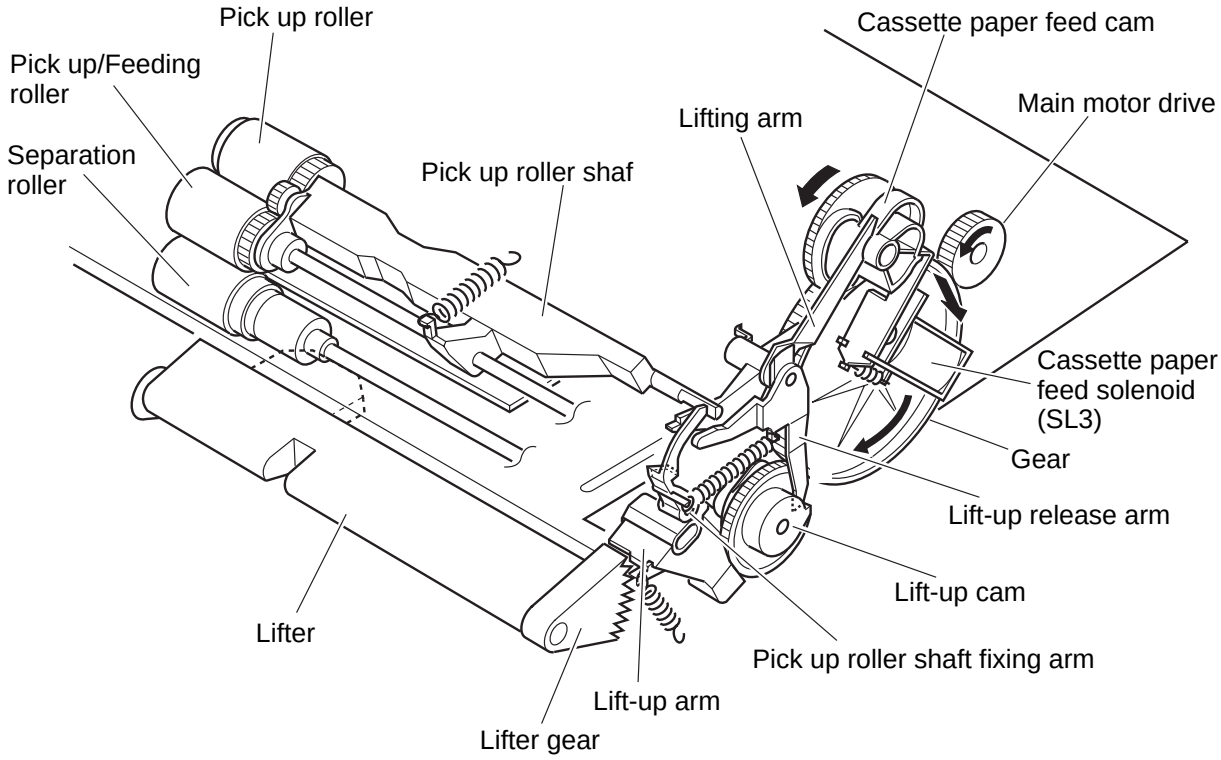

Figure 2-205

a. Operation when a cassette is inserted

[1] When a cassette is installed, the main motor starts to turn and the cassette paper feed solenoid (SL3) goes on. Gear transmission causes the cassette paper feed cam to rotate and drive the lifting arm.

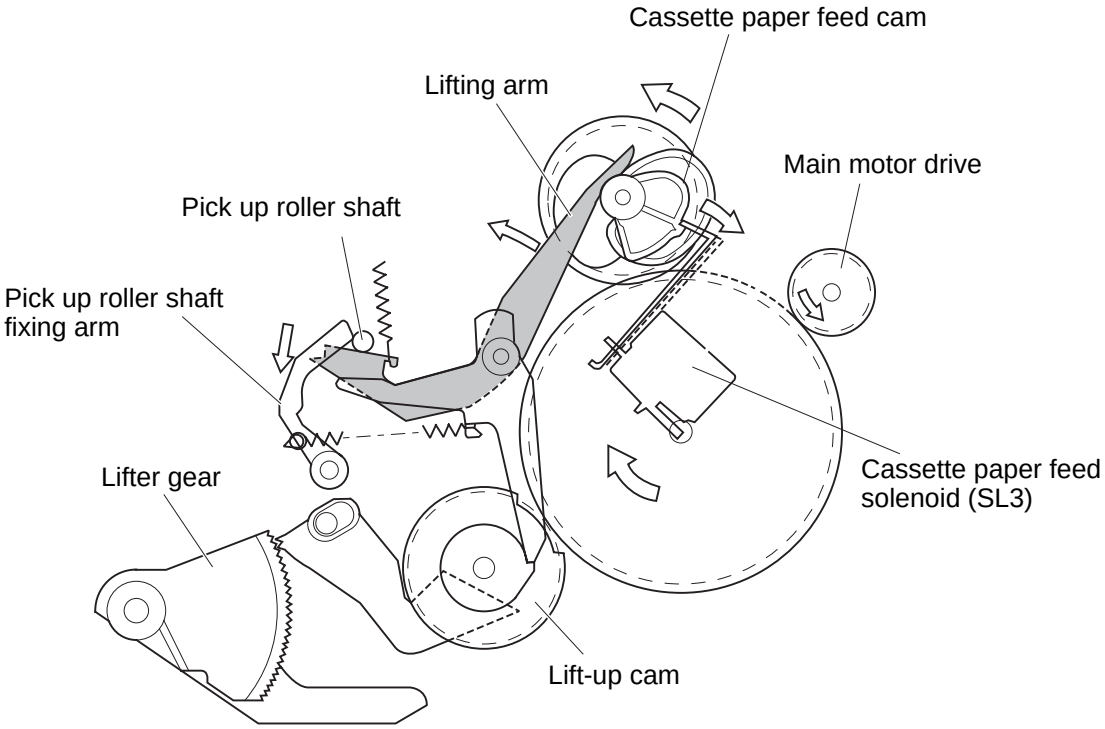

Figure 2-206

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[2] When the lifting arm descends, the Pick up roller shaft is lowered. This action exerts pressure on the lift-up release arm to release the lift-up cam. Simultaneously, the lifting arm is secured by the Pick up roller shaft fixing arm, and the Pick up roller shaft stops in the designated position.

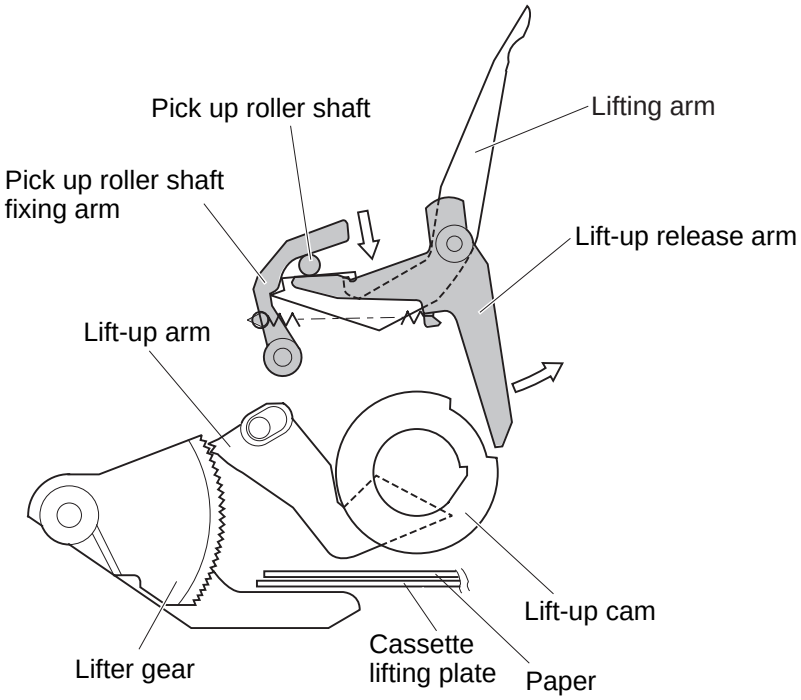

Figure 2-207

[3] When the lift-up cam is released, it starts to rotate, causing the lift-up arm to raise the lift-up gear one sprocket. This operation is repeated, raising the cassette lifting plate.

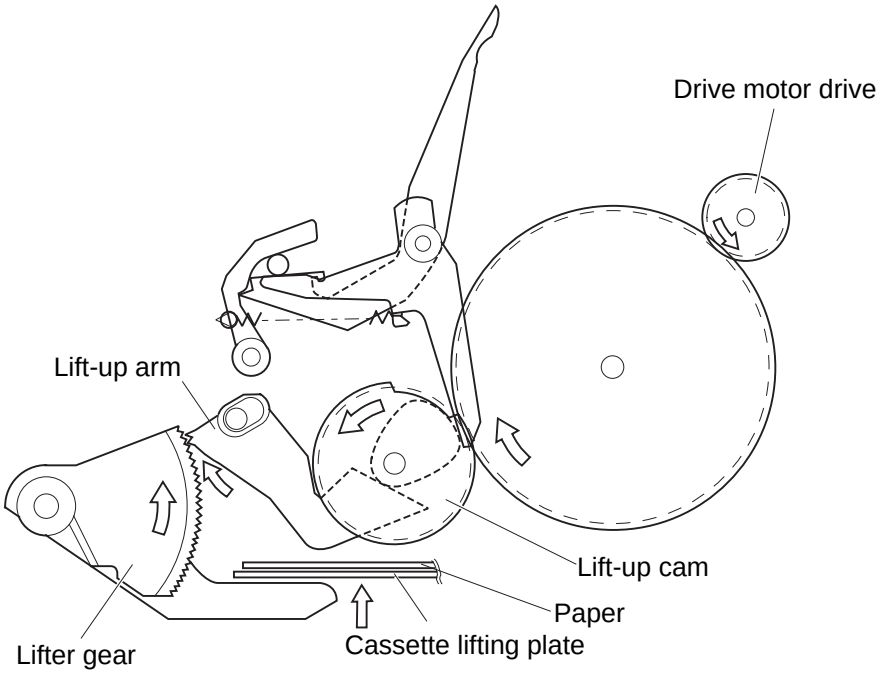

Figure 2-208

[4] When the paper on the cassette lifting plate comes into contact with the Pick up roller, the Pick up roller shaft is raised. As a result, the fixing arm is released and the lift-up release arm raises the Pick up roller shaft to the stand-by position through the force of the spring. Simultaneously, drive is transmitted to the Pick up roller shaft fixing arm and the lift-up release arm, causing them to secure the lift-up arm. This action causes the lift-up arm to stop thereby finish the lift-up operation.

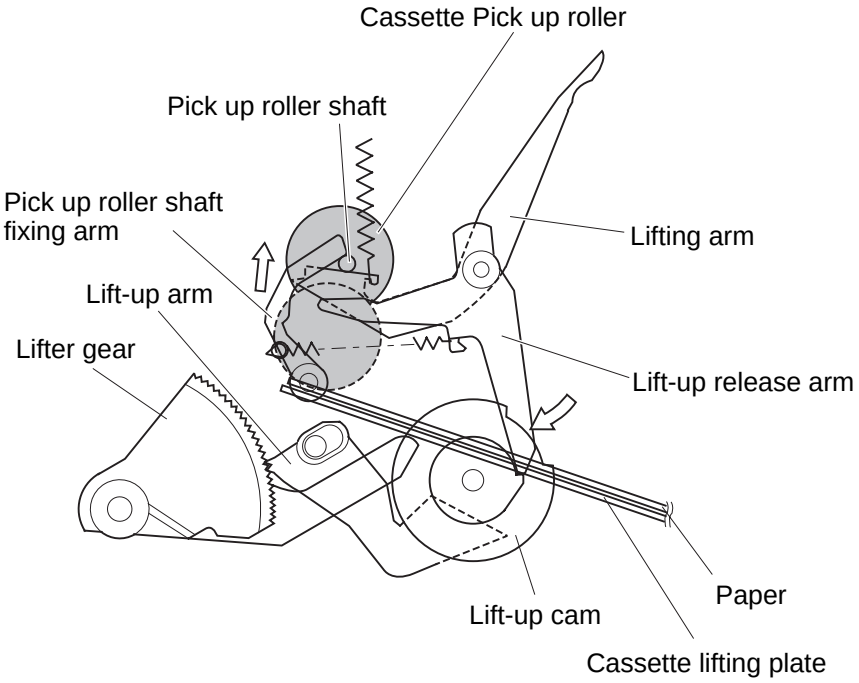

Figure 2-209

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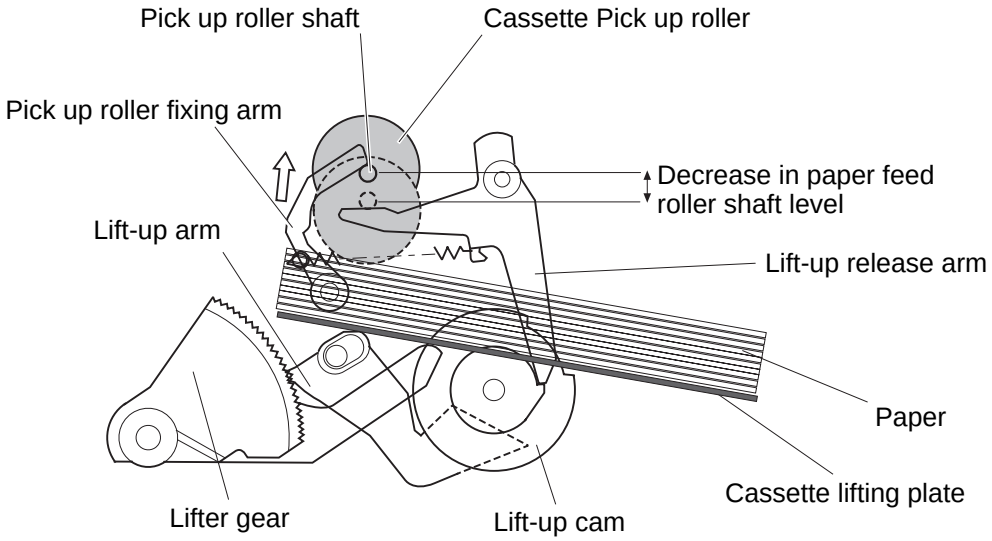
b. When the paper level drops below a set level

[1] As the paper level drops below a set level, the amount that Pick up roller has to be lowered during paper feed increases. This causes the Pick up roller shaft to press against the lift-up release arm, releasing the lift-up cam.

<Normal Operation>



<When paper level drops below a set level>

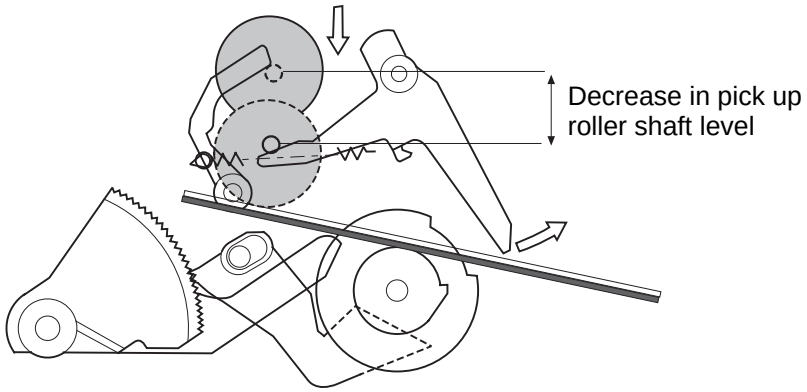


Figure 2-210

[2] When the lift-up cam is released, it starts to rotate and the lift-up arm raises the lift-up gear by one sprocket. This operation is repeated and the cassette lifting plate is raised. (See Figure 2-208)

[3] When the paper on top of the cassette lifting plate comes into contact with the Pick up roller, the Pick up roller shaft is raised. As a result, the fixing arm is released and the lift-up release arm raises the Pick up roller shaft to the stand-by position through the force of the spring. Simultaneously drive is transmitted to the Pick up roller shaft fixing arm and the lift-up release arm, causing them to secure the lift-up arm. This action causes the lift-up arm to stop, thereby finish the lift-up operation. (See Figure 2-209)

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4. Double feed Prevention Mechanism

The unit is equipped with a separation roller system to prevent double feed during cassette paper feed. Normally, the separation roller applies torque in the opposite direction of the Pick up/Feeding roller. However, the separation roller is equipped with a torque limiter so that it rotates through torque transmitted from Pick up/Feeding roller via the paper. However, when double feeding occurs, the torque supplied by the Pick up/Feeding roller to the separation roller through the paper becomes very weak, since the amount of friction between the two sheets of paper is low. Then, the torque of the separation roller returns the extra sheet.

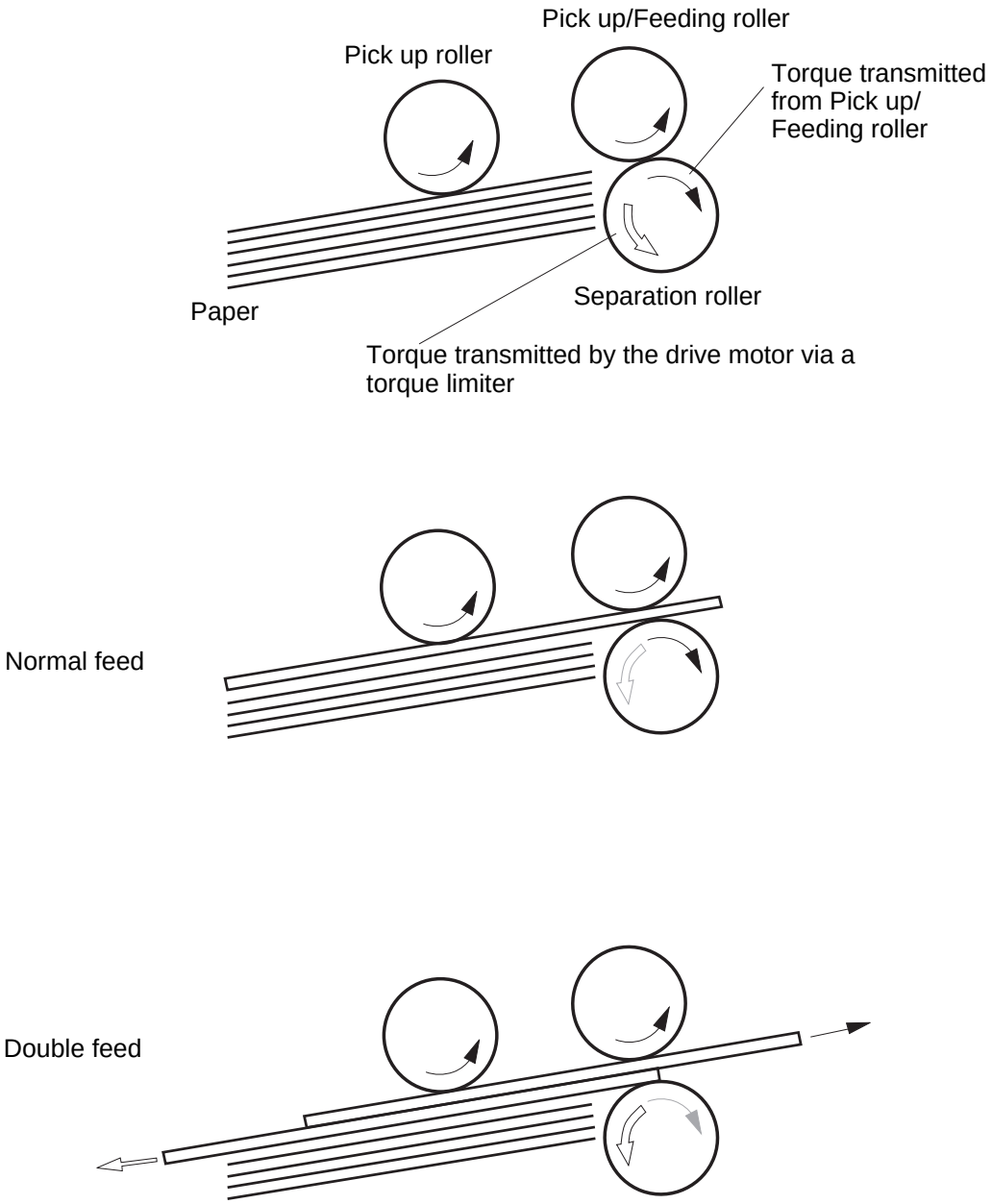

Figure 2-211

C. Jam Detection

The paper sensors listed below are used to detect the presence of paper and that paper is being correctly delivered.

- Registration paper sensor (PS1)
- Jam sensor (PS2)

Paper jams are detected depending on whether or not the paper appears at the different sensors within the check timing intervals stored in the microprocessor (CPU) in the paper deck drive PCB.

When the CPU senses that a paper jam has occurred, paper feed to the copier is stopped and the option controller PCB is notified of the paper jam.

1. Registration Paper Sensor Delay Jam

When paper does not reach the registration paper sensor (PS1) within the stipulated time after start of paper feeding, the CPU assumes that a registration paper sensor delay jam has occurred.

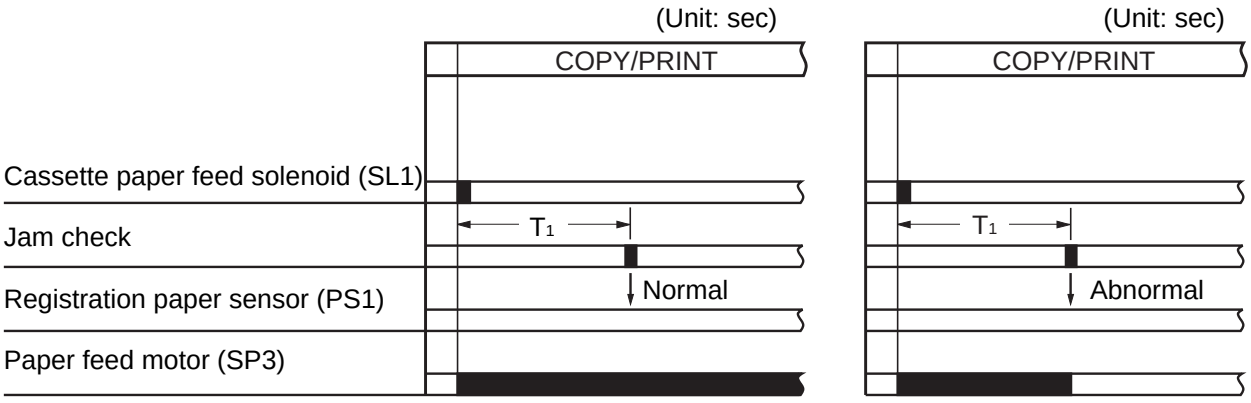

Figure 2-212

- For cassette 3 paper feeding
  T_1= approximately 1.31 sec
- For cassette 4 paper feeding
  T_1 = approximately 1.72 sec

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2. Jam Sensor Delay Jam

When the paper leading edge does not reach the jam sensor (PS2) in the stipulated time (T_2= approximately 0.99 sec) after the registration roller clutch starts, the CPU assumes that a jam sensor delay jam has occurred.

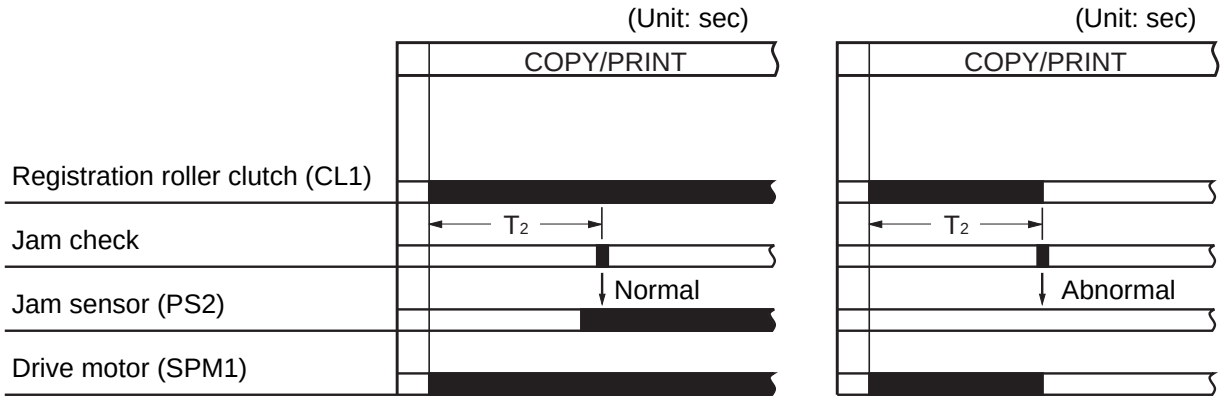

Figure 2-213

3. Jam Sensor Stationary Jam

When the trailing edge of the paper does not pass the jam sensor (PS2) in the stipulated time (T_3= approximately 0.60 sec) after it has detected the leading edge of the paper, the CPU assumes that a jam sensor stationary jam has occurred.

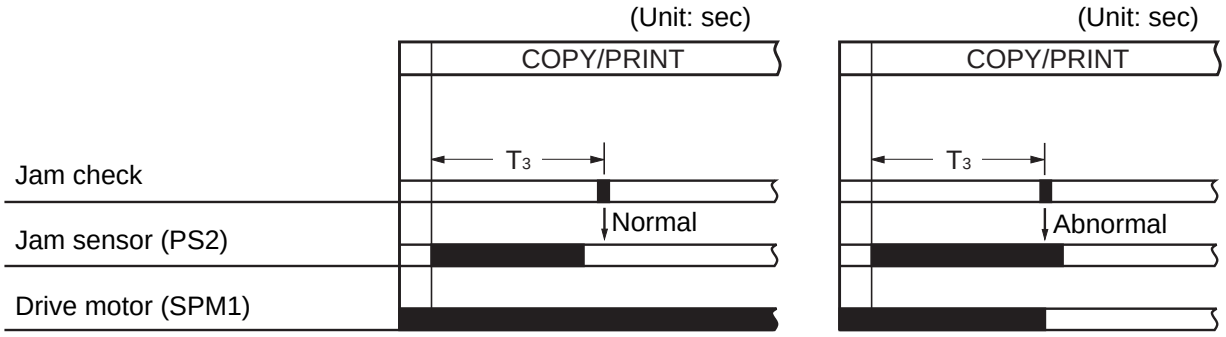

Figure 2-214

4. Internal Stationary Jam

When the registration paper sensor (PS1) or the jam sensor (PS2) detects paper at the start of initial rotation? the CPU assumes that an internal stationary jam has occurred.

5. Retry Control

Retry control is a procedure that performs paper feed operation twice to clear paper feed delay jams caused by incorrect paper feed. When the registration paper sensor (PS1) does not detect the leading edge of the paper within a stipulated time after start of paper feed, the same paper feed operation is performed again.

III. POWER SUPPLY

A. Overview

The power supply of the unit is equipped with a remote switch system.

When the power switch of the printer assembly is turned on, the option controller PCB outputs a power on signal (PWRON-IN) to the power supply unit, via the paper deck driver PCB. When the PWRON-IN signal is “H”, the power supply provides +24 V and +5 V to the paper deck driver PCB.

The drive motor, delivery motor, paper feed motor, registration roller clutch and the paper feed solenoid use +24 V, while the sensors and the paper deck driver PCB ICs, etc., use +5 V.

The unit is also provided with a power switch (SW1). This makes it possible to turn on the paper deck independently without having to also turn on the printer assembly. A block diagram of the power supply is shown below.

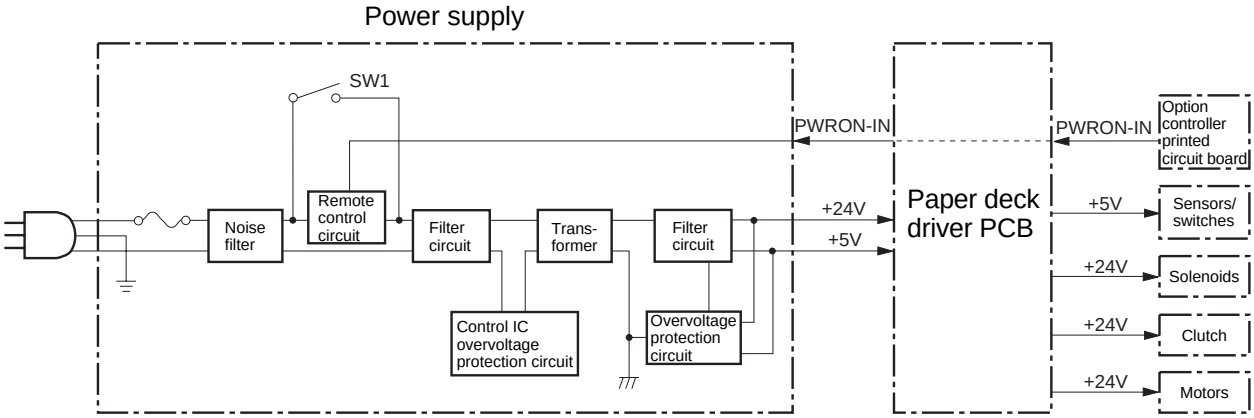

Figure 2-301

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B. Protective Functions

The +24 V and +5 V power circuits are equipped with an overvoltage and overcurrent protective functions that automatically turn off the output voltage to prevent the breakdown of power supply circuits in the event overcurrent or overvoltage caused by electrical shorts or other problems on the load side..

When the overvoltage and overcurrent protection functions have been triggered, and DC voltage is no longer being supplied from the power supply circuit, turn off the power switch on the printer assembly, correct the problem on the load side before turning on the printer assembly power switch.

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CHAPTER 3

MECHANICAL SYSTEM

This chapter describes mechanical features and operations as well as disassembly and assembly procedures.
The following precautions must be observed during disassembly and assembly work.

1. ⚠ For the sake of safety, disconnect the power plug before performing any disassembly or assembly work.
2. Unless otherwise specified, assembly work is performed in the reverse order of the disassembly operations.
3. Be sure to use the right type (diameter and length) or screws in the right places.
4. An inner-clip washer is used with one securing screw in the metal cover to prevent buildup of static electricity. Make sure to use this washer during assembly work.
5. In principal, the copier must not be operated when parts have been removed.

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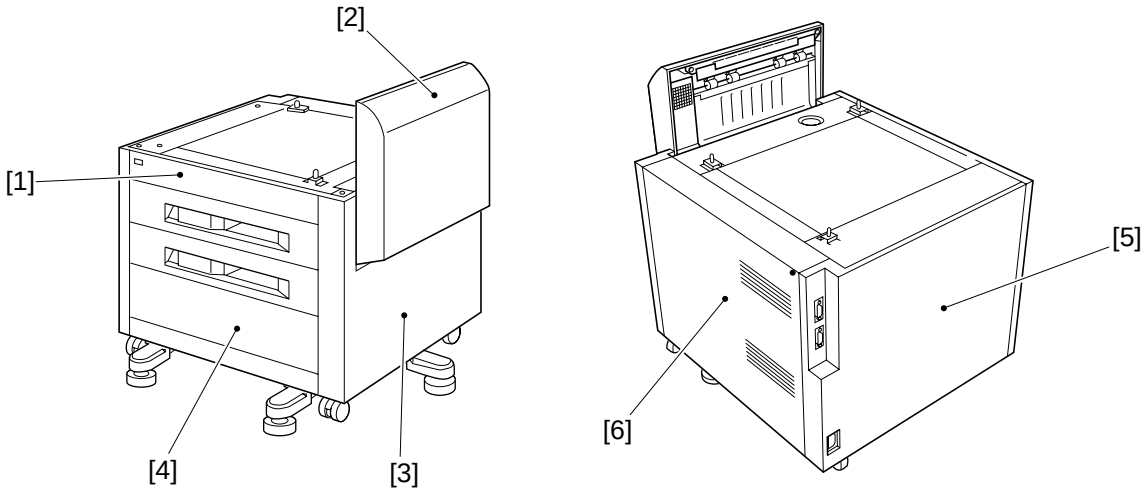
I. EXTERNAL COVERS

A. External Cover Types

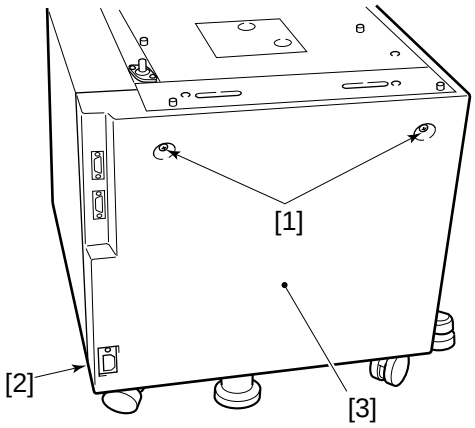


[1] Upper front cover
[2] Delivery cover
[3] Right cover
[4] Storage space
[5] Left cover
[6] Rear cover

Figure 3-101

B. Left cover

1) Remove the two screws.
2) Release the hook and remove the left cover.

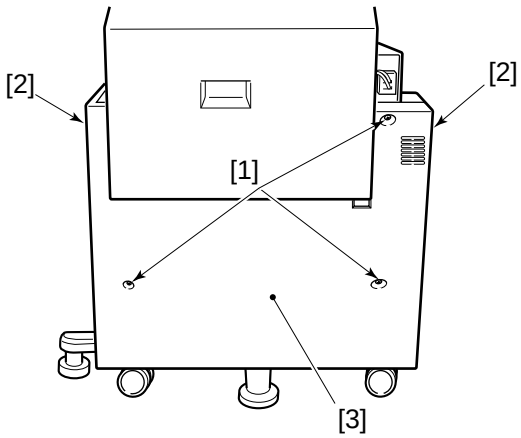


[1] Screw
[2] Hook
[3] Left cover

Figure 3-102

C. Right cover

1) Remove the rear cover.
2) Remove the three screws.
3) Release the two hooks and remove the right cover.

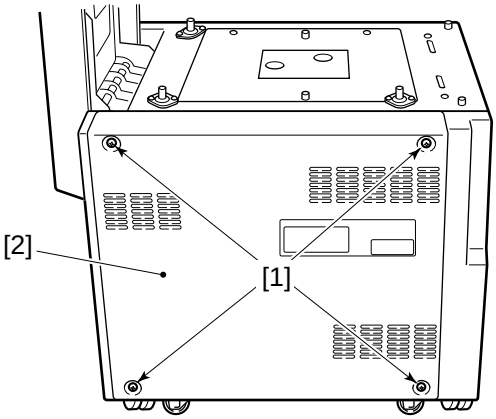


[1] Screw
[2] Hook
[3] Right cover

Figure 3-103

D. Rear cover

1) Remove the four screws and the rear cover.

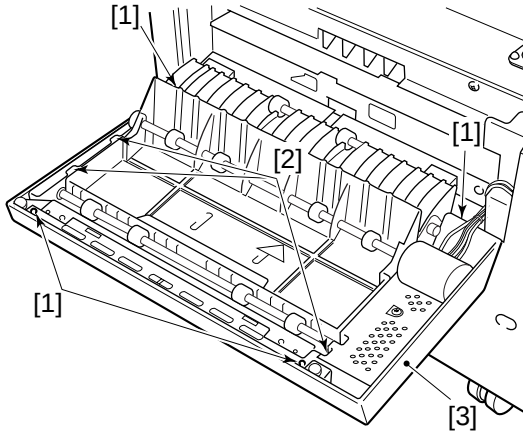


[1] Screw
[2] Rear cover

Figure 3-104

E. Delivery cover

1) Remove the four screws, the three hooks and the delivery cover.



[1] Screw
[2] Hook
[3] Delivery cover

Figure 3-105

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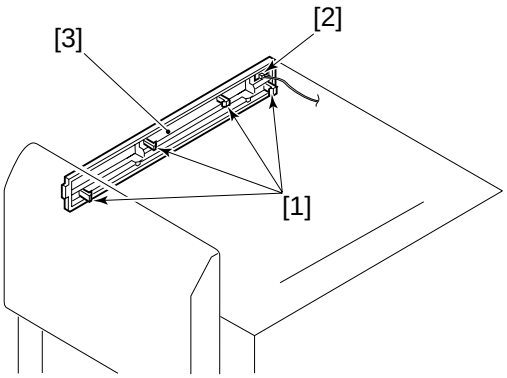
F. Upper Front Cover

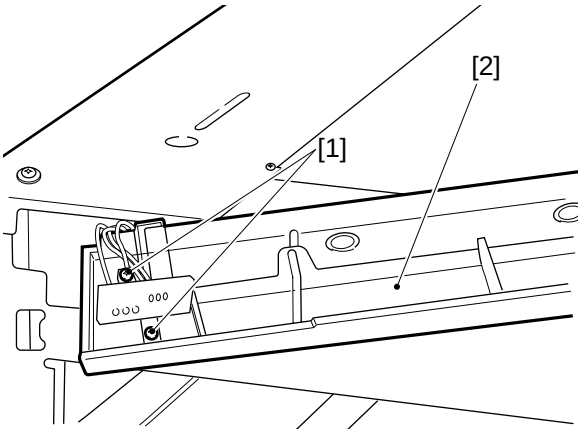
1) Remove the rear cover, the left cover and the right cover.
2) Loosen the hooks of the four tabs, the LED PCB and slide the upper front cover towards front side.



[1] Hook
[2] LED PCB
[3] Upper front cover

Figure 3-106

3) Remove the two hooks and the upper front cover.



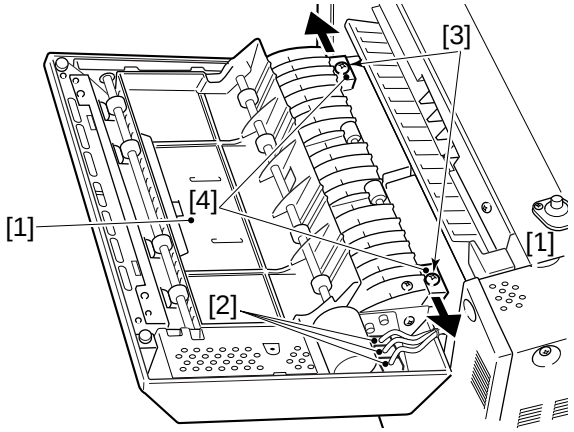
[1] Hook
[2] Upper front cover

Figure 3-107

II. DRIVE ASSEMBLY

A. Delivery Unit

1) Open the delivery unit.
2) Remove the three connectors.
3) Slide the delivery spacers in the direction of the arrows.
4) Remove the two screws and the delivery unit.

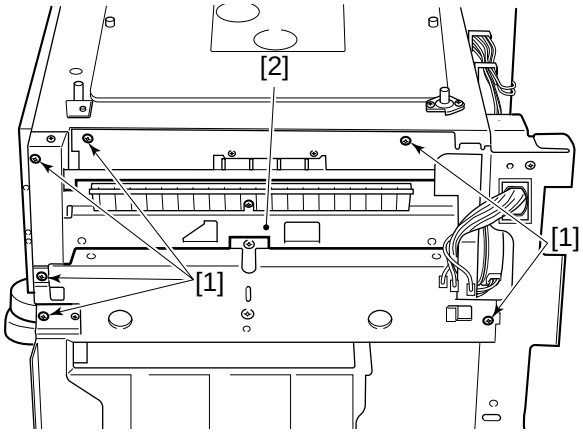


[1] Delivery unit
[2] Connector
[3] Screws
[4] Delivery spacers

Figure 3-201

B. Paper Feed Unit

1) Remove the rear cover and right cover.
2) Remove the delivery unit according to the instructions on page 3-4.
3) Remove the 6 screws and slide the paper feed unit towards front side.



[1] Screws
[2] Paper feed unit

Figure 3-202

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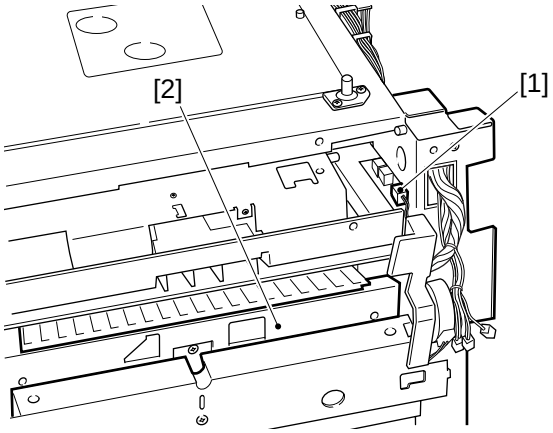
4) Remove the connector and the paper feed unit.



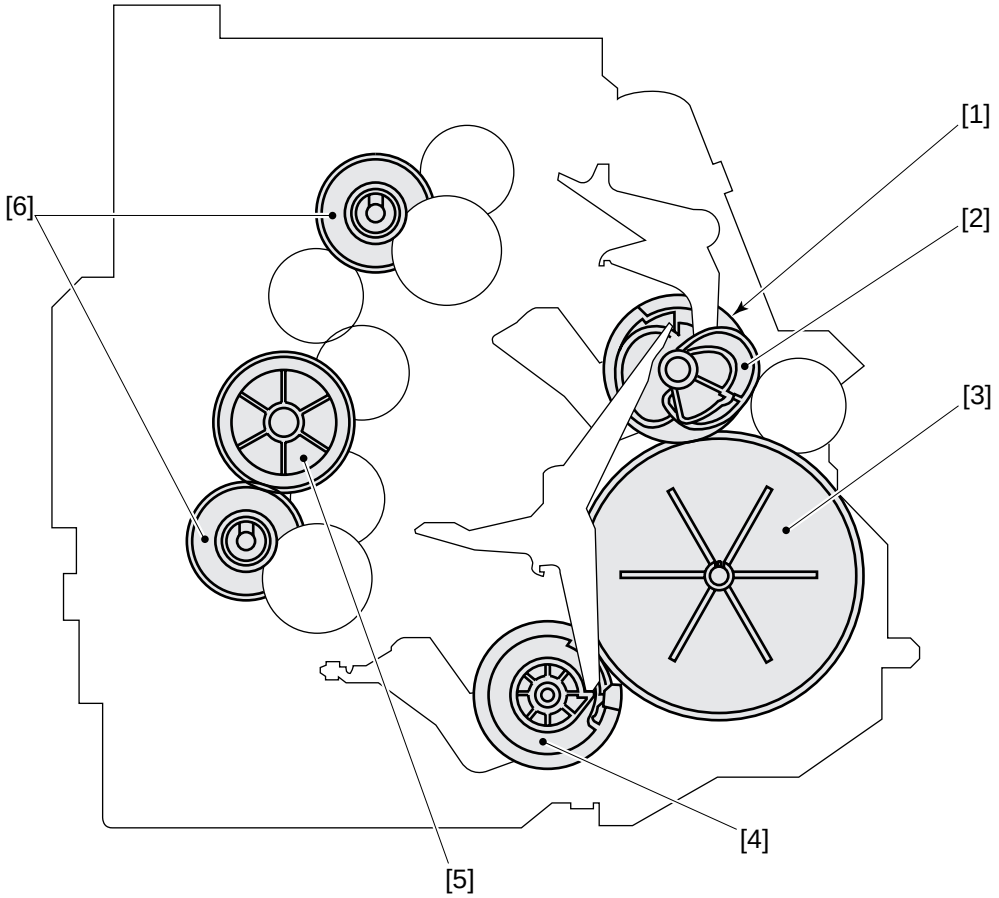
[1] Connector
[2] Paper feed unit

Figure 3-203

Caution:

1. When the paper feed unit is to be replaced, first remove the Pick up roller, Pick up/Feeding roller and separation roller, to prevent them from becoming smeared with grease. Also, make sure that no grease adheres to the delivery guide.
2. When gears are replaced (Figure 3-204), coat them with some grease to reduce noise. The type of grease to be used (only designated type of grease can be used) and method of application are shown below.

Grease : Permalube SHV-2
Method of application : Apply a small amount of grease to three or more consecutive sprockets of the gear.



[1] Upper lift-up cam
[2] Paper feed cam
[3] 100T cam
[4] Lower lift-up cam
[5] 31T/47T gear
[6] 20T41T gear

Figure 3-204

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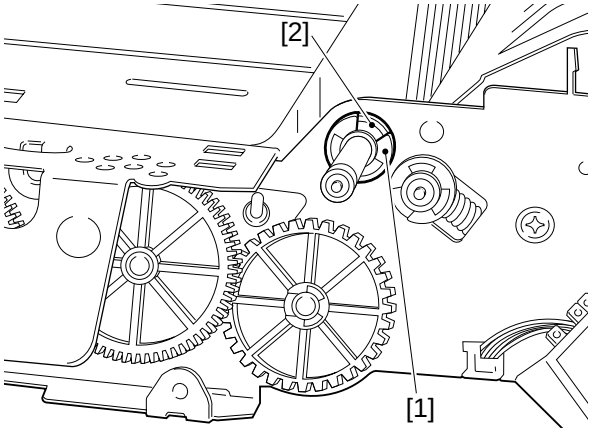
C. Registration Roller

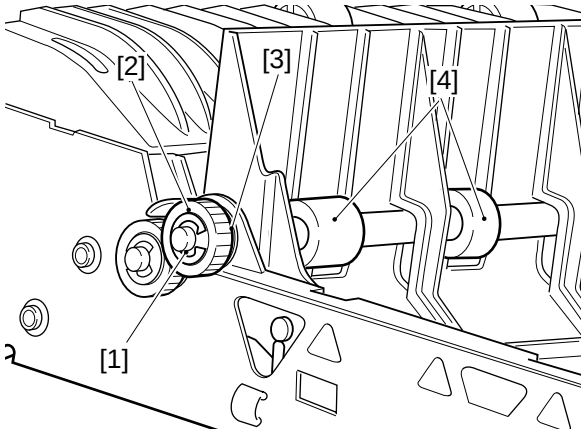
1) Remove the registration roller clutch according to the instructions in the procedure for removing the registration roller clutch (on page 3-10).
2) Remove the E-ring and bushing.



[1] E-ring
[2] Bushing

Figure 3-205

3) Remove the E-ring, gear, pin, bushing and registration roller.

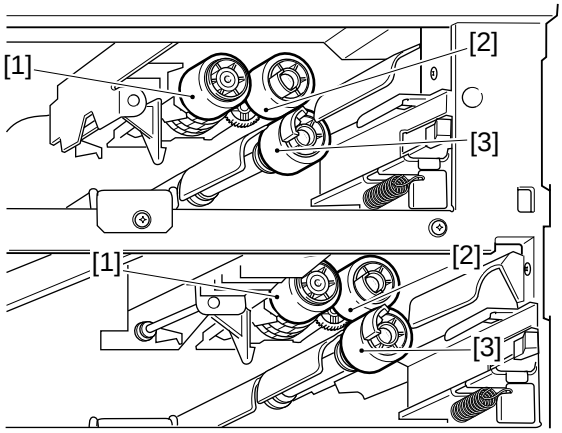


[1] E-ring
[2] Gear
[3] Bushing
[4] Registration roller

Figure 3-206

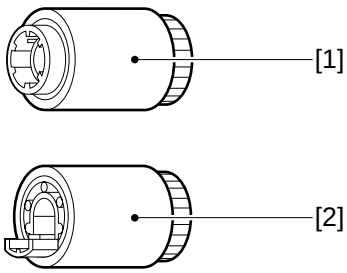
D. Pick up roller, Pick up/Feeding Roller, Separation Roller

1) Take hold of the roller knobs and pull them out



[1] Pick up roller
[2] Pick up/Feeding roller
[3] Separation roller

Figure 3-207



[1] Pick up roller
[2] Pick up/Feeding roller roller/separation roller

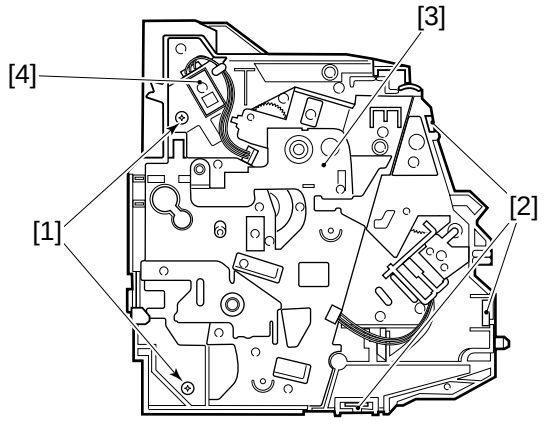
Figure 3-208

Caution:

Replace the delivery roller and separation roller at the same time.

E. Paper Delivery Unit Sensor

1) Remove the paper feed motor according to the instructions in the procedure for removing the paper feed motor (on page 3-12).
2) Remove the paper feed PCB according to the instructions in the procedure for removing the paper feed PCB (on page 3-13).
3) Remove the two screws, three tabs and the gear cover.



[1] Screw
[2] Hook
[3] Gear cover
[4] Paper delivery unit sensor

Figure 3-209

4) Remove the connector, four hooks and the delivery unit sensor.

F. Registration Paper Sensor, Jam Sensor

1) Remove the delivery unit according to the instructions in the procedure for removing the delivery unit (on page 3-4).
2) Remove the delivery cover.
3) Remove the connector, four hooks and the sensor.

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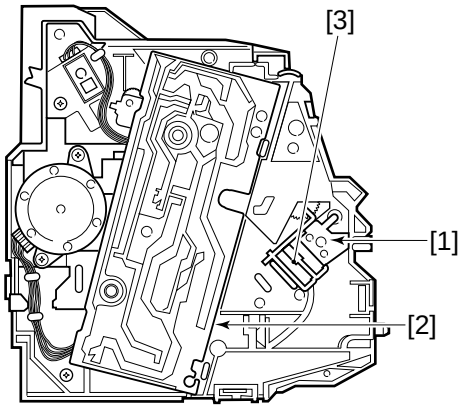
G. Cassette 3/4 Sensor; Cassette 3/4 Remaining Paper Sensors 1, 2; Cassette 3/4 Paper Out Sensor

1) Remove the paper feed PCB according to the instructions in the procedure for removing the paper feed PCB (on page 3-13).

H. Paper Feed Solenoid

1) Remove the paper feed unit according to the instructions in the procedure for removing the paper feed unit (on page 3-4).
2) Remove the screws, connector and solenoid.

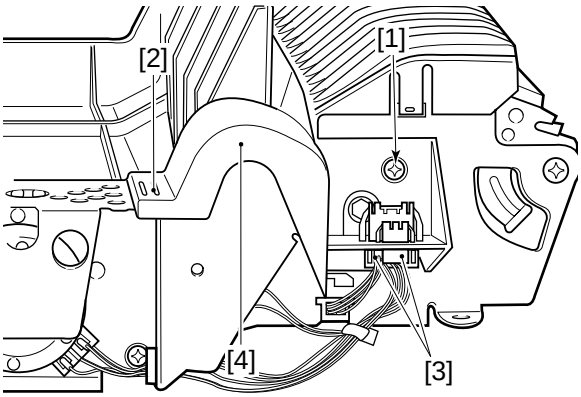


[1] Screw
[2] Connector
[3] Paper feed solenoid

Figure 3-210

I. Registration Roller Clutch

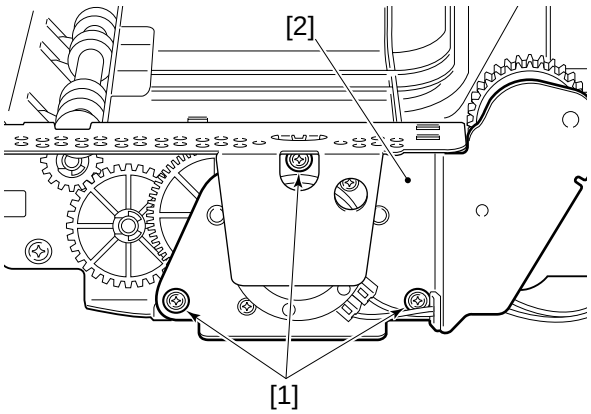
1) Remove the delivery unit according to the instructions in the procedure for removing the delivery unit (on page 3-4).
2) Remove the delivery cover.
3) Remove the screw, tab, two connectors and the clutch cover.



[1] Screw
[2] Tab
[3] Connector
[4] Clutch cover

Figure 3-211

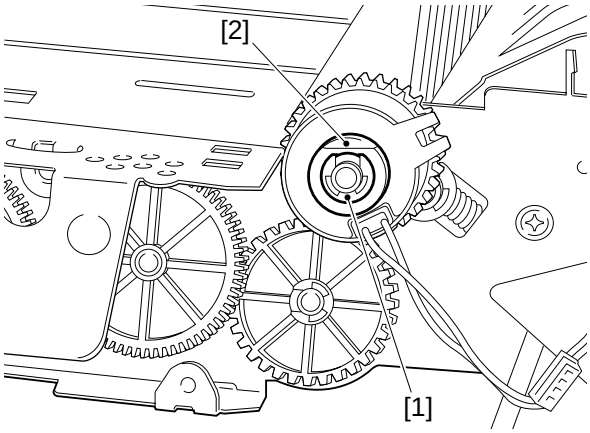
4) Remove the three screws and the delivery motor mount.



[1] Screw
[2] Delivery motor mount

Figure 3-212

5) Remove the E-ring and registration roller clutch.



[1] E-ring
[2] Registration roller clutch

Figure 3-213

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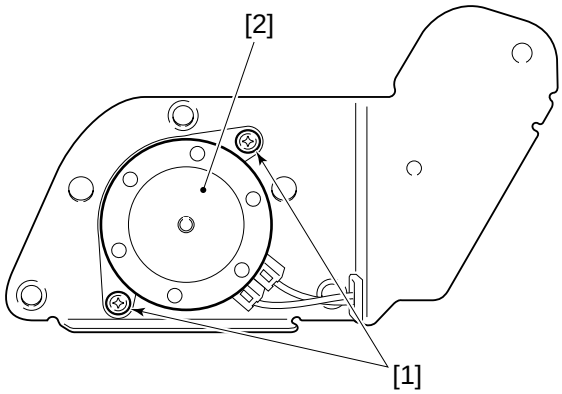
J. Delivery Motor

1) Remove the delivery motor mount according to the instructions in the procedure for removing the registration roller clutch (on page 3-10).
2) Remove the two screws and the delivery motor.

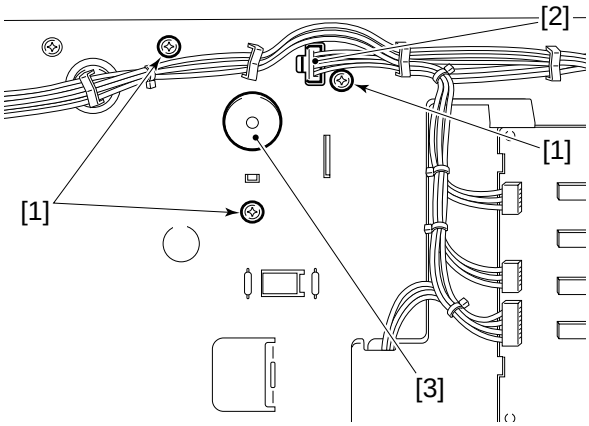


[1] Screw
[2] Delivery motor

Figure 3-214

K. Lifter motor

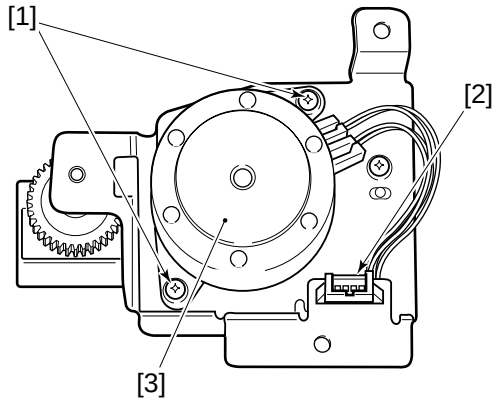
1) Remove the paper feed unit according to the instructions in the procedure for removing the paper feed unit (on page 3-4).
2) Remove the three screws, connector and slide the lifter motor upwards to remove it.



[1] Screw
[2] Connector
[3] Lifter motor

Figure 3-215

3) Remove the two screws, connector and lifter motor.

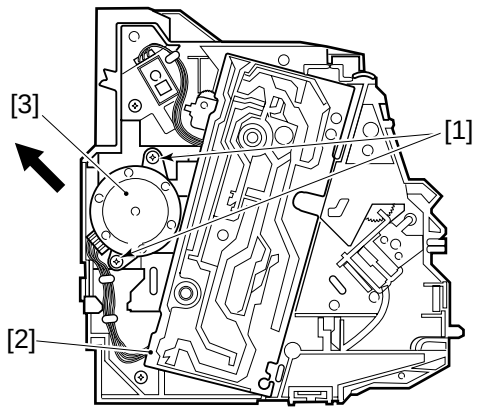


[1] Screw
[2] Connector
[3] Lifter motor

Figure 3-216

L. Paper Feed Motor

1) Remove the paper feed motor according to the instructions in the procedure for removing the paper feed unit (on page 3-4).
2) Remove the two screws and slide the paper feed motor in the direction of the arrow.



[1] Screw
[2] Connector
[3] Paper feed motor

Figure 3-217

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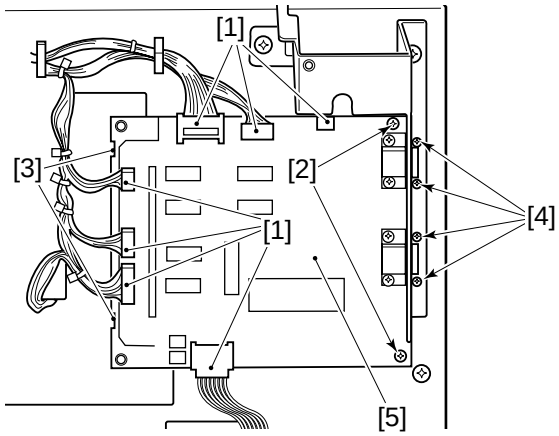
III. PCBs

A. Lifter Motor Driver PCB

1) Remove the rear cover and the left cover.
2) Remove the seven connectors, two screws, two hooks, four nuts and the lifter motor driver PCB.

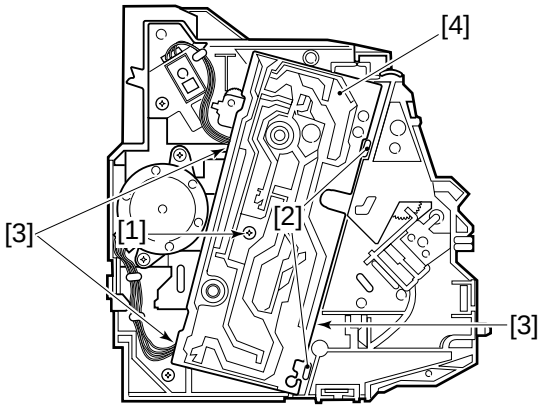


[1] Connector
[2] Screw
[3] Hook
[4] Nut
[5] Lifter motor driver PCB

Figure 3-301

B. Paper Feed PCB

1) Remove the paper unit according to the instructions in the procedure for removing the paper feed unit (on page 3-4).
2) Remove the screw, two hooks, three connectors and the paper feed PCB.

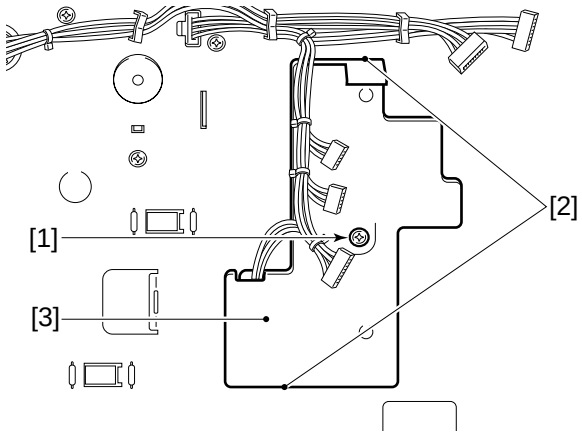


[1] Screw
[2] Hook
[3] Connector
[4] Paper feed PCB

Figure 3-302

C. Cassette 3 Paper Size Detector PCB

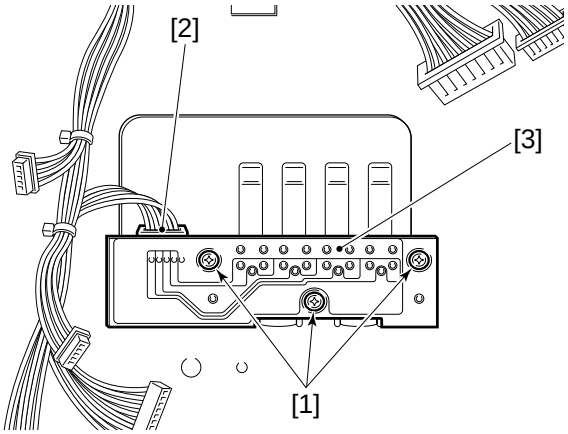
1) Remove the lifter motor driver PCB according to the instructions for removing the lifter motor driver PCB (on page 3-13).
2) Remove the two hooks and the mount.



[1] Screw
[2] Hook
[3] Mount]

Figure 3-303

3) Remove the three screws, connector and the cassette 3 paper size detection PCB.



[1] Screw
[2] Connector
[3] Cassette 3 paper size detection PCB

Figure 3-304

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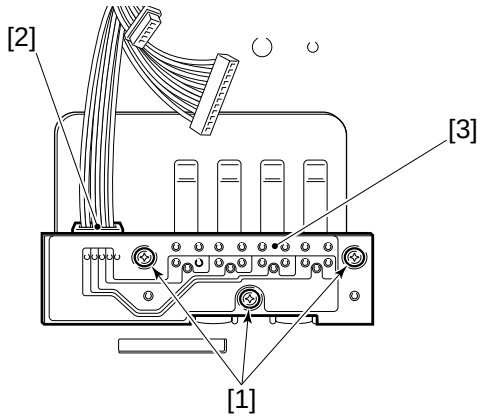
D. Cassette 4 Paper Size Detector PCB

1) Remove the lifter motor driver PCB and mount according to the instructions for removing the cassette 3 paper size detection PCB mount.
2) Remove the three screws, connector and cassette 4 paper size detection PCB.

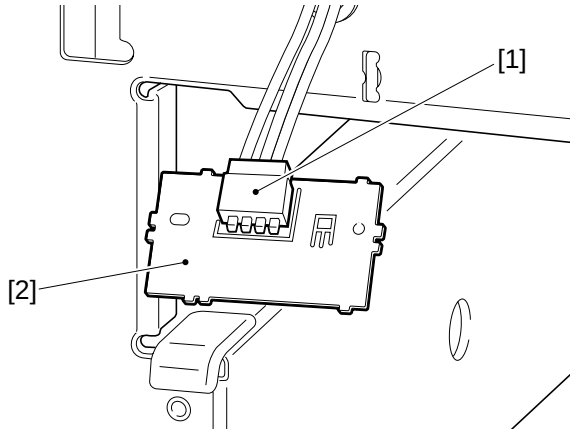


[1] Screw
[2] Connector
[3] Cassette 4 paper size detection PCB

Figure 3-305

E. LED PCB

1) Remove the upper front cover.
2) Remove the connector and the LED PCB.



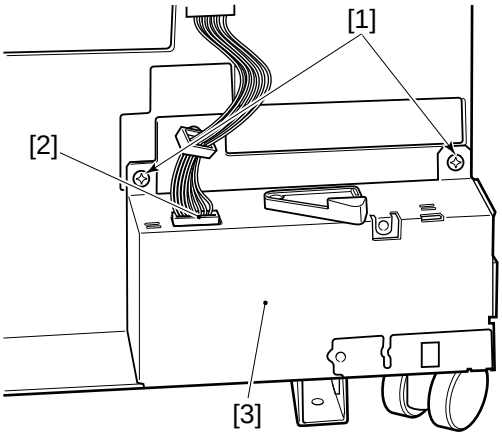
[1] Connector
[2] LED PCB

Figure 3-306

IV. POWER SUPPLY

A. Power Supply Unit

1) Remove the rear cover and left cover.
2) Remove the two screws and the power supply unit.



[1] Screw
[2] Connector
[3] Power supply unit

Figure 3-401

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CHAPTER 4

MAINTENANCE AND INSPECTION

I. PERIODICALLY REPLACED PARTS.....4-1
II. CONSUMABLES AND DURABLES 4-1
III. SCHEDULED SERVICING 4-1
IV. PARTS TO BE CLEANED DURING A CUSTOMER SERVICE CALL.....4-2

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I. PERIODICALLY REPLALED PARTS

There are no parts in the unit that need to be periodically replaced.

Caution:

Periodic replacement parts are parts that must be replaced periodically to maintain product function to a certain level (even though there is no visible external damage, the loss of function of such parts has a serious effect on overall product performance). Such parts should be replaced at the periodic service closest to when the specified number of sheets has been printed.

II. CONSUMABLES AND DURABLES

These parts may require replacement once or more during the warranty period due to deterioration or damage. The expected life (number of pages) of parts that do not need to be replaced until they fail is indicated below.

As of December, 1998

No.	Name	Part No.	Quantity	Expected life span	Remarks
1	Delivery roller, separation roller	RF5-1834-000	2	350,000 sheets	The delivery roller and separation roller must be replaced at the same time.

Table 4-201

Caution:

The information in the table above is only an estimate, and may be revised in the light of empirical data.

III. SCHEDULED SERVICING

There are no parts that require periodic service.

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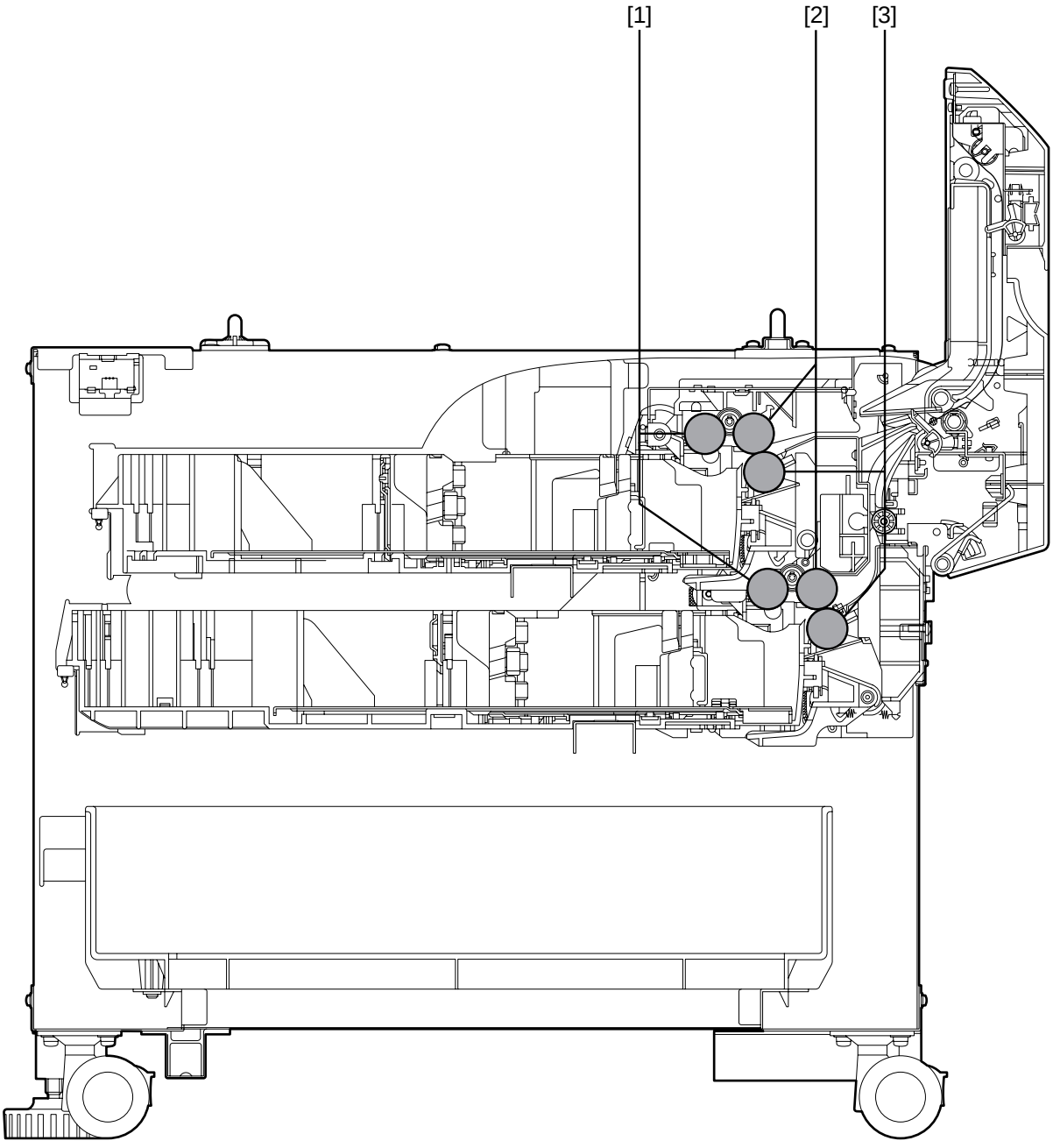
IV. PARTS TO BE CLEANED DURING A CUSTOMER SERVICE CALL

1. Paper Feed Roller, Separation Roller, Delivery Roller

Use lint-free paper or a cloth moistened in alcohol to clean these parts.



[1] Paper feed roller
[2] Delivery roller
[3] Separation roller

Figure 4-401

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CHAPTER 5

TROUBLESHOOTING

I. STANDARDS AND ADJUSTMENTS 5-1
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B. Operational Checks to be Performed by the User.....5-1
C. Operational Checks to be Performed by the Service Engineer.....5-2
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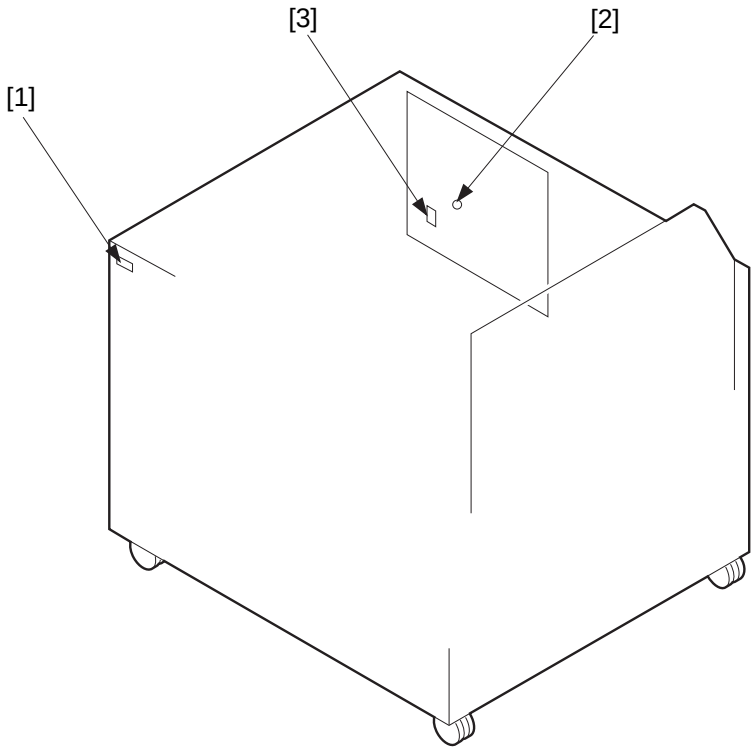
I. STANDARDS AND ADJUSTMENTS

A. Overview

When a breakdown or jam occurs in the unit, the condition of the unit can be checked by the user LED (LED1: green and orange 2-color light) on the LED PCB and the service LED (LED201: red light) in the paper deck driver PCB. In combination with the DIP switches (SW201) on the paper deck driver PCB you can check the details of breakdowns and errors.



[1] User LED
[2] Service LED
[3] DIP switch

Figure 5-101

B. Operational Checks to be Performed by the User

The condition of the user LED (LED1) in the unit enables you to check operational conditions.

1) Continuous green light: the unit and the printer assembly are communicating normally.
2) Flashing orange light: a paper jam has occurred, a door is open or other condition requiring operator intervention has occurred.
3) Continuous orange light: breakdown

The user LEDs operate only when the DIP switches are in the following state: SW201-1: OFF, SW201-2: OFF, SW201-3: OFF, SW201-4: OFF (factory default settings).

C. Operational Checks to be Performed by the Service Engineer

The combination of DIP switch indications and service LED (LED201) lighting makes it possible check the operational condition of the unit.

1. Normal operation

During normal operation the DIP switches are in the following state: SW201-1: OFF, SW201-2: OFF, SW201-3: OFF, SW201-4: OFF.

The service LED repeats a cycle consisting of 0.5 sec on and 0.3 sec off when the unit is operating normally. When an error occurs, the service LED flashes in the cycle shown below: header (1.0 sec on, 0.2 sec off), detected error details (0.3 sec on, 0.2 sec off) and pause (2.0 sec off).

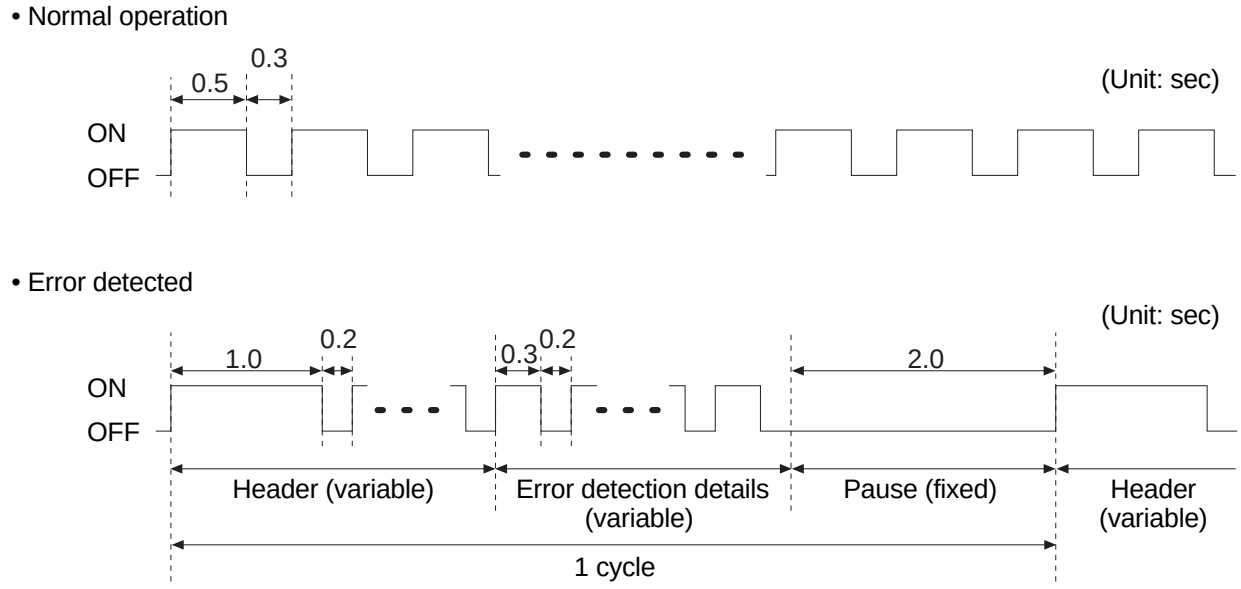


Figure 5-102

Use the information in Table 5-101 to identify errors based on service LED lighting status. For example, when the service LED flashes twice in the header section, and three times in the error detection section, a jam sensor delay jam has occurred.

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Header	Detection details	Error description
2	1	Registration paper sensor delay jam
	2	Registration paper sensor initial jam
	3	Jam sensor delay jam
	4	Jam sensor stationary jam
	4	Jam sensor initial jam
1	1	Door open
	2	No cassette or cassette being lifted up
	3	Out of paper

Table 5-101

2. Sensor Check

To enter the sensor check mode, set the DIP switches to the following settings: SW201-1: OFF, SW201-2: OFF, SW201-3: ON, SW201-4: ON; then turn on the power.

When the sensor check mode is entered, you can check the state of the 11 sensors and 8 switches listed below.

Registration paper sensor (PS1)
Jam sensor (PS2)
Delivery assembly sensor (PS3)
Cassette 4 remaining paper sensor (PS1203, PS1204)
Cassette 4 sensor (PS1201)
Cassette 4 paper out sensor (PS1207)
Cassette 3 remaining paper sensor (PS1205, PS1206)
Cassette 3 sensor (PS1202)
Cassette 3 paper out sensor (PS1208)
Cassette size 3/4 detection switches (SW1601, SW1602, SW1603, SW1604)

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<Operation Procedure>

1) Turn off the printer assembly.
2) Open the rear cover.
3) Set the DIP switches as follows: SW201-1: OFF, SW201-2: OFF, SW201-3: ON, SW201-4: ON
4) Select one of the following two methods depending on the sensors or switches that are to be checked.
   a. Open the delivery cover and turn on the power.
      Registration paper sensor (PS1)
      Jam sensor (PS2)
      Delivery assembly sensor (PS3)
   b. Remove cassette 3 or cassette 4, and turn on the power.
      Cassette 4 remaining paper sensor (PS1203, PS1204)
      Cassette 4 sensor (PS1201)
      Cassette 4 paper out sensor (PS1207)
      Cassette 3 remaining paper sensor (PS1205, PS1206)
      Cassette 3 sensor (PS1202)
      Cassette 3 paper out sensor (PS1208)
      Cassette size 3/4 detection switches (SW1601, SW1602, SW1603, SW1604)
5) Press the sensor levers or switches to check if the LED goes on or not.
   Since it is not possible to check which sensor is malfunctioning when two sensor levers are pressed, press one at a time. And do not touch the switches with bare hands.
6) If an LED does not go on, this indicates that the corresponding switch or LED is malfunctioning.

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3. Test Paper Feed

A test paper feed starts when the DIP switches are set as follows, and the power is turned on: SW201-1: ON, SW201-2: OFF, SW201-3: ON, SW201-4: OFF. This test continues as long as there is paper in the cassette.

The paper feed mode is exited by turning off SW201-1 and the test paper feed is interrupted. The test paper feed can be resumed by setting SW201-1 back to ON again.

Caution:

1. Since the printer assembly is not on when the unit is in the paper feed mode, fed paper and delivered sheets will cause a paper jam in the printer assembly. Thus, if multiple sheets are loaded in a cassette in the paper feed mode when the unit is installed in the printer assembly, paper will be continuously fed to the printer assembly, causing repeated jams. For this reason, place only one paper sheet in the cassette.
2. When tests in the paper feed mode are completed, turn off all DIP switches.

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II. TROUBLESHOOTING MALFUNCTIONS

1	No power

Cause/Location of error	Step	Check item	Result	Measure
Poor interface connector contact	1	Is the power on signal input?	NO	Correct interface connector connection.
Defective power switch	2	Remove the power supply assembly and place the tester lead pins on each side of the power switch terminals. Check if the tester gives a reading of 0 when the switch is set to ON and a reading of when it is set to OFF.	NO	Replace the power supply assembly.
Blown power assembly fuse	3	Turn off the power switch and wait two minutes before turning it on again. Does the unit operate normally now?	NO	Remove the power supply assembly and replace the blown fuse.
Triggered overcurrent/overvoltage detection circuit			YES	Disconnect the power supply connector and connect it again. If this does not help, correct the cause that triggered the overcurrent/overvoltage detection circuits in the power supply assembly and turn on the power again.
Defective power assembly	4	Turn off the printer assembly power switch and disconnect connector J203 on the paper deck driver PCB. Turn on the unit power switch and measure the DC power supply output of cable connector J203. (Be sure not to short-circuit any component at this time.) Does the J203 connector output the measured DC power supply?	NO	Replace the power supply assembly.
Wiring, DC load, paper deck driver PCB			YES	Check the wiring and DC load ahead of the paper deck driver PCB. If the wiring and the DC load are OK, replace the paper deck driver PCB.

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2 Motor Breakdown

Cause/Location of error	Step	Check item	Result	Measure
Poor contact in motor drive signal line connector	1	Are connector J205 and motor connector J301 on the paper deck drive PCB correctly connected?	NO	Correct connection.
Defective motor	2	Can the error condition be remedied by replacing the motor?	YES	Replace the motor.
Paper deck driver PCB	3	Can the error condition be remedied by replacing the paper deck driver PCB?	YES	Replace the paper deck driver PCB.

3 Delivery Motor Breakdown

Cause/Location of error	Step	Check item	Result	Measure
Poor contact in delivery motor drive signal line connector	1	Are connector J206 and delivery motor connector J302 on the paper deck drive PCB correctly connected?	NO	Correct connection.
Defective delivery motor	2	Can the error condition be remedied by replacing the delivery motor?	YES	Replace.
Paper deck driver PCB	3	Can the error condition be remedied by replacing the paper deck driver PCB?	YES	Replace the paper deck driver printed PCB.

4 Paper Feed Motor Breakdown

Cause/Location of error	Step	Check item	Result	Measure
Poor contact in paper feed motor drive signal line connector	1	Are connector J208 and paper feed PCB connectors J1201 and J1202 on the paper deck drive PCB correctly connected?	NO	Correct connection.
Defective paper feed motor	2	Can the error condition be remedied by replacing the paper feed motor?	YES	Replace.
Defective paper feed PCB	3	Can the error condition be remedied by replacing the paper feed PCB?	YES	Replace.
Paper deck driver PCB			NO	Replace the paper deck driver PCB.

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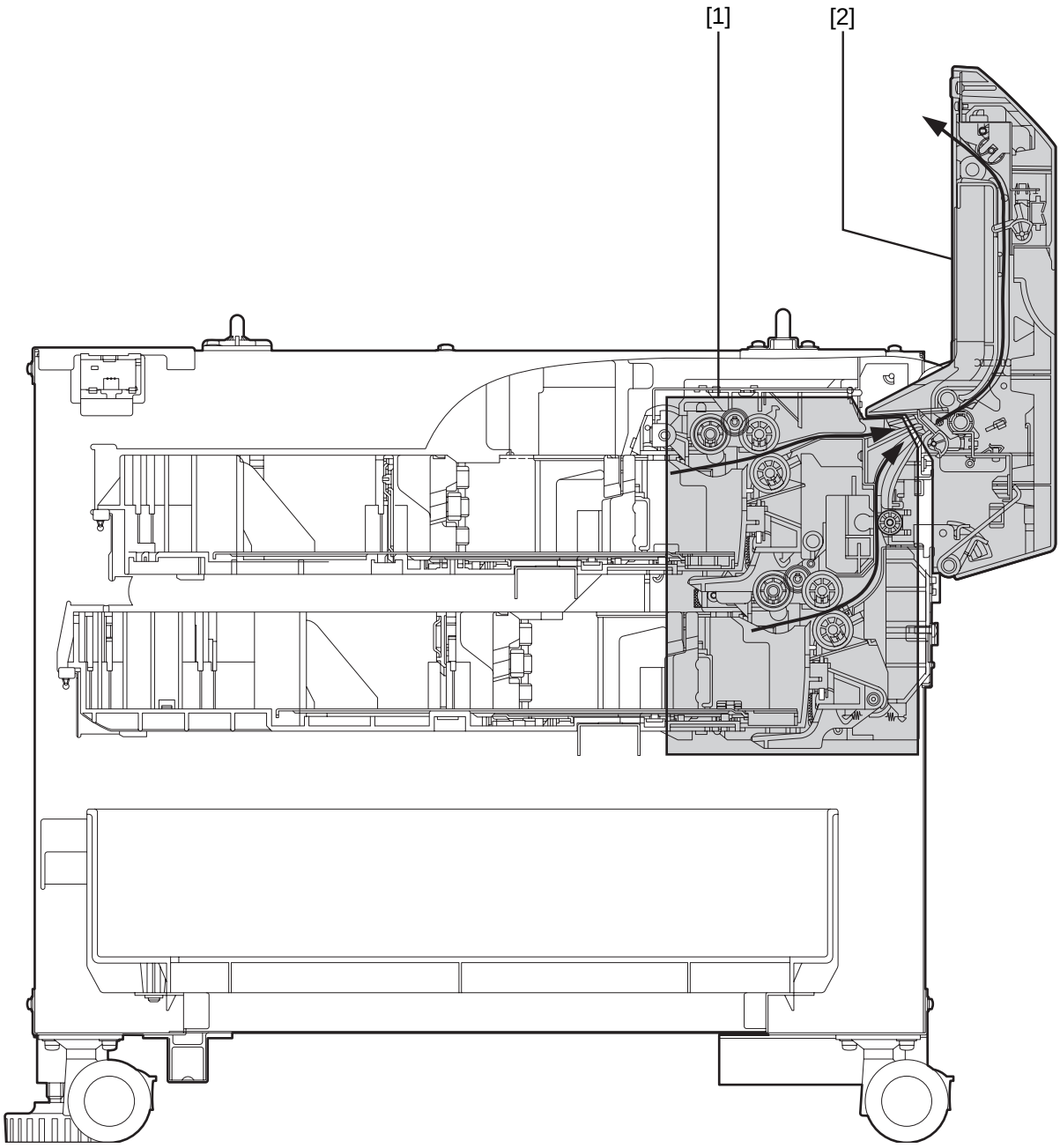
III. TROUBLESHOOTING JAMS

A. Paper Jams

Perform this procedure when a paper jam occurs in the unit.

The delivery path consists of two units: 1: paper feed assembly and 2: delivery assembly. Refer to the stationary jam block, and trace the location of the jam.



[1] Paper feed assembly
[2] Delivery assembly

Figure 5-301

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1 Cassette Paper Feed Block

Cause/Location of error	Step	Check item	Result	Measure
Cassette Pick up roller Pick up/Feeding roller	1	Is the cassette Pick up roller or Pick up/Feeding roller worn or deformed?	YES	Replace. Both the separation roller and Pick up/Feeding roller must be replaced at the same time.
Gears	2	Remove the paper feed assembly and check drive gears and springs. Are there any worn or damaged parts? Are there any loose springs?	YES	Replace worn or damaged parts. Correct springs.
Poor contact in paper feed motor drive connector	3	Are connector J208 and paper feed PCB connectors J1201 and J1202 on the paper deck drive PCB correctly connected?	NO	Correct connection.
Paper feed motor breakdown	4	Can the error condition be remedied by replacing the paper feed motor?	YES	Replace.
Paper feed PCB breakdown	5	Can the error condition be remedied by replacing the paper feed PCB?	YES	Replace.
Paper deck driver PCB			NO	Replace the paper deck driver PCB.

2 Delivery Assembly

Cause/Location of error	Step	Check item	Result	Measure
Jam sensor	1	Open the delivery assembly after the test paper feed. Did the leading edge of the paper reach the jam sensor?	YES	Go to step 10.
Defective detection mechanism in registration paper sensor	2	Is the registration paper sensor lever or spring worn or deformed? Are there any loose springs?	YES	Replace if damaged or deformed. Correct spring position.
Registration paper sensor breakdown	3	Can the error condition be corrected by replacing the registration paper sensor?	YES	Replace.
Registration roller	4	Is the registration roller worn, deformed or dirty?	YES	Replace if worn or deformed. Clean to remove dirt.
Gears	5	Remove the delivery assembly and check drive gears and springs. Are there any worn or damaged parts? Are there any loose parts?	YES	Replace if damaged or deformed. Correct spring position.
Poor contact in delivery motor drive connector	6	Are connector J205 and connector J302 on the paper deck drive PCB correctly connected?	NO	Correct connection.
Delivery motor breakdown	7	Can the error condition be corrected by replacing the delivery motor?	YES	Replace.
Poor contact in registration roller clutch drive signal line connector	8	Are registration roller clutch connector J306, relay connector J210 and connector J207 on the paper deck drive PCB correctly connected?	NO	Correct connection.
Defective registration roller clutch	9	Disconnect registration roller clutch connector J306. Measure the resistance of cable connectors J306-1 (REGCLD*) and J306-2 (+24 V). Is it approx. 210 Ω?	NO	Replace the registration roller clutch.
Jam sensor	10	Are the jam sensor lever and springs damaged or deformed? Is the sensor lever spring loose?	YES	Replace if damaged or deformed. Correct spring position.
Jam sensor breakdown	11	Can the error condition be corrected by replacing the jam sensor?	YES	Replace.
Delivery roller 2	12	Is delivery roller 2 worn, deformed or dirty?	YES	Replace if worn or deformed. Clean to remove dirt.
Paper deck driver PCB	13	Can the error condition be corrected by replacing the paper deck driver PCB?	YES	Replace.

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B. Incomplete Feed

1 Multi-feed

Cause/Location of error	Step	Check item	Result	Measure
Separation roller	1	Is the separation roller worn or deformed?	YES	Replace the separation roller.
Springs	2	Is the spring that holds the separation roller correct?	NO	Replace the spring if it is damaged. Correct its position if it is loose.

2 Wrinkled paper

Cause/Location of error	Step	Check item	Result	Measure
Rollers	1	Check the paper feed assembly and delivery assembly rollers. Are they worn or deformed?	YES	Replace if worn or deformed.

3 Leading edge folding

Cause/Location of error	Step	Check item	Result	Measure
Delivery guide	1	Check the paper delivery path. Are the delivery guides damaged or deformed?	YES	Replace damaged or deformed delivery guides.

4 Skew Feed

Cause/Location of error	Step	Check item	Result	Measure
Delivery roller, registration roller, separation guide	1	Has paper dust or dirt accumulated in the delivery roller, registration roller or separation roller guides?	YES	Clean to remove dirt.
Paper feed assembly/delivery assembly rollers	2	Are there any damaged or deformed paper feed assembly and delivery assembly rollers?	YES	Replace any damaged or deformed rollers.

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IV. LOCATION OF ELECTRICAL PARTS

A. Sensors

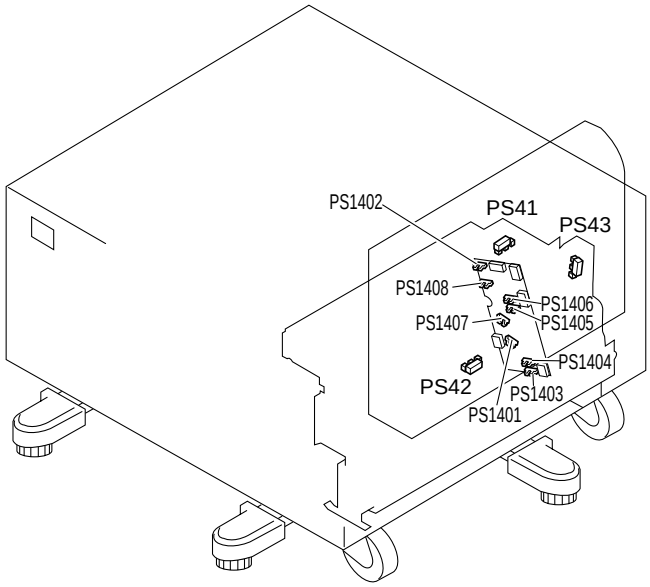


Figure 5-401

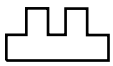
Symbol	Name	Signal	Function
	Photo interrupter	PS1	Registration paper sensor
		PS2	Jam sensor
		PS3	Paper feed unit sensor
		PS1201	Cassette 4 sensor
		PS1202	Cassette 3 sensor
		PS1203	Cassette 4 remaining paper sensor 1
		PS1204	Cassette 4 remaining paper sensor 2
		PS1205	Cassette 3 remaining paper sensor 1
		PS1206	Cassette 3 remaining paper sensor 2
		PS1207	Cassette 4 paper out sensor
		PS1208	Cassette 3 paper out sensor

Table 5-401

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B. Solenoids, Clutches and Motors

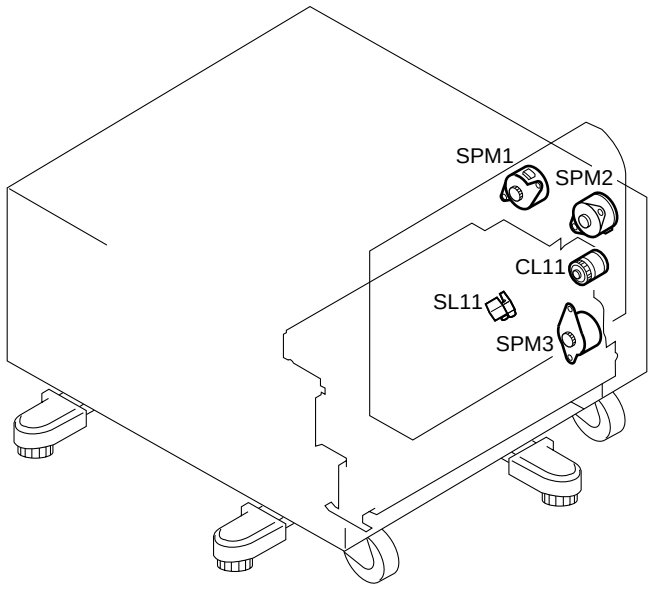

Figure 5-402

Symbol	Name	Signal	Function
SL	Solenoid	SL1	Paper feed solenoid
CL	Clutch	CL1	Registration roller clutch
M	Motors	SPM1 SPM2 SPM3	Lifter motor Delivery motor Drive motor

Figure 5-402

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C. PCBs

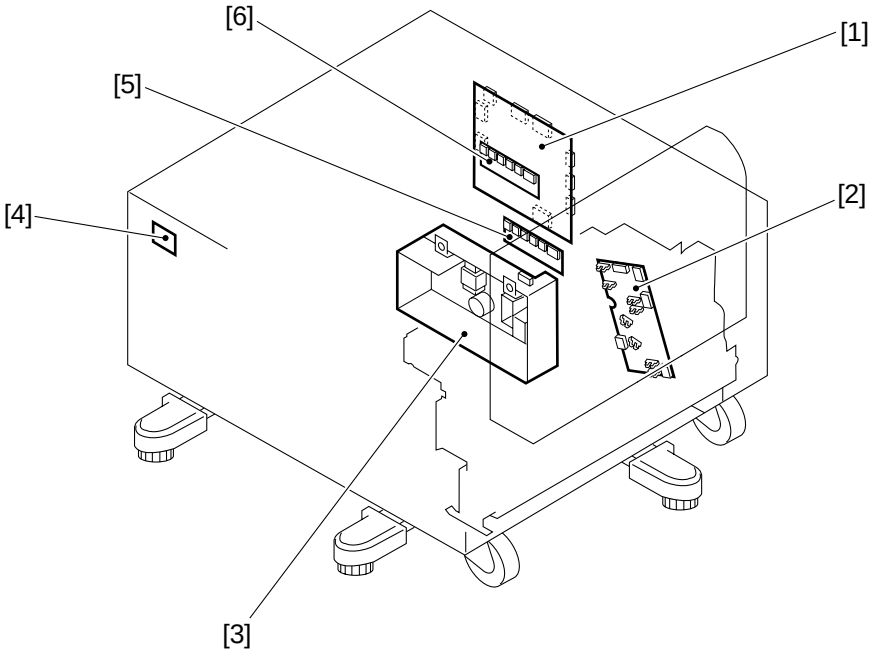

Figure 5-403

No.	Name	Function
[1]	Paper deck driver PCB	Control of loads and defection of various items
[2]	Paper feed PCB	Cassette and cassette paper detection
[3]	Power supply unit	Power supply
[4]	LED PCB	Machine status display
[5]	Cassette 3 paper size detection PCB	Cassette 3 paper size detection
[6]	Cassette 4 paper size detection PCB	Cassette 4 paper size detection

Table 5-403

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V. LIST OF VARIABLE RESISTORS (VR), LEDS, CHECK PINS BY PCB

Only the LEDs and check pins that need to be checked during field service are listed below.

Caution:

Check pins not listed below are only for factory use, and their adjustment and check requires special tools and measurement instruments. Their adjustments require a greater degree of accuracy and must not be touched during field service.

Caution:

Some LEDs leak a small amount of current even when normal, and therefore glow faintly even when they are off. Do not mistake this phenomenon for their being ON.

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A. Paper Deck Driver PCB

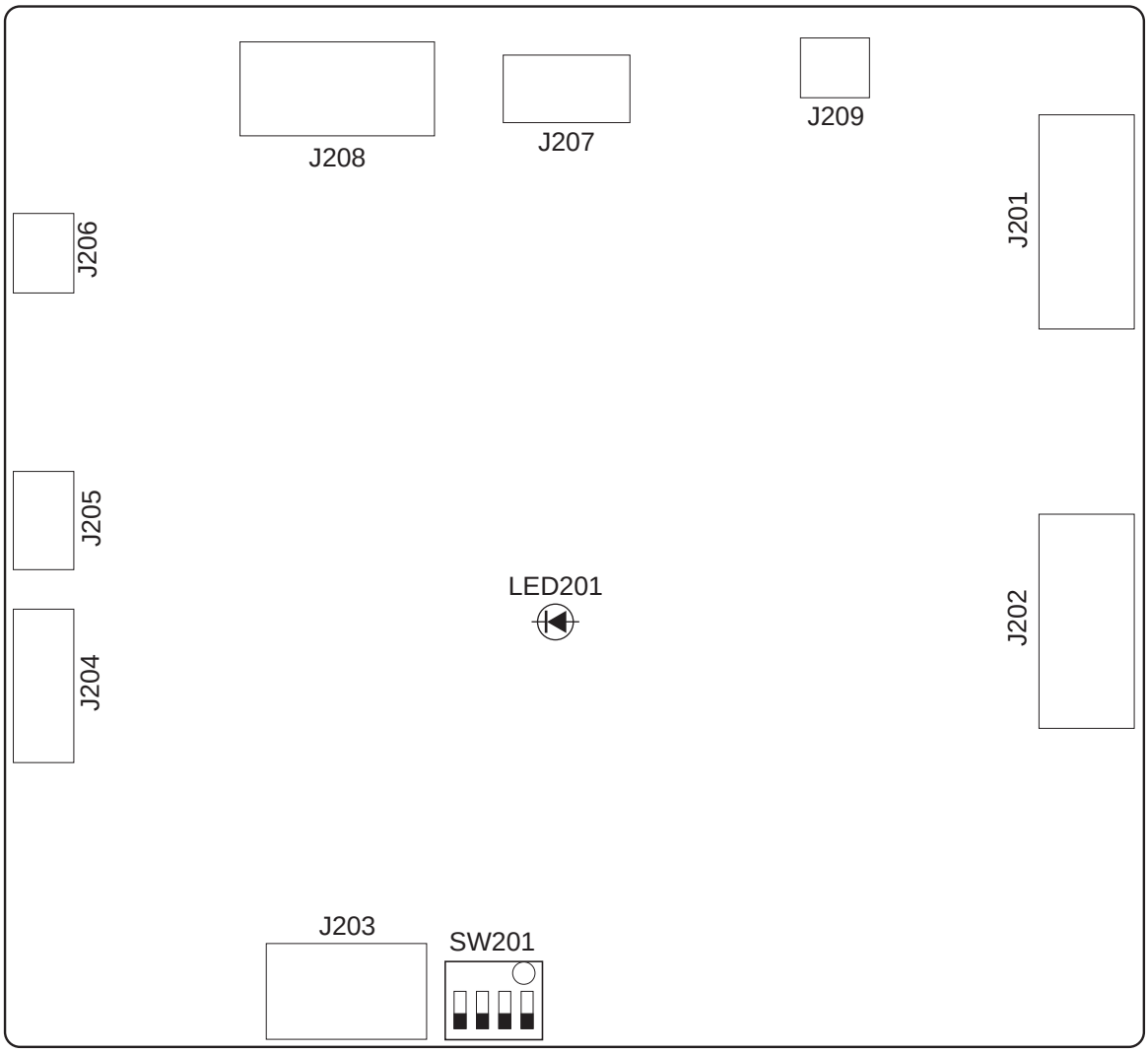

Figure 5-501

No.		Role
SW 201	1	Switch for operation check (see page 5-1 and beyond)
	2	
	3	
	4	
LED202		Inspect for Sevicing

Table 5-501

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B. Paper Size Detection Switch PCB

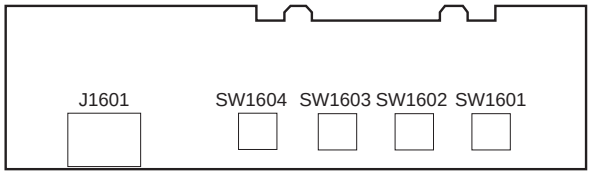

Figure 5-502

SW No.	Role
SW1601	Cassette size detection switch (see page 2-9)
SW1602	
SW1603	
SW1604	

Table 5-502

C. User LED PCB

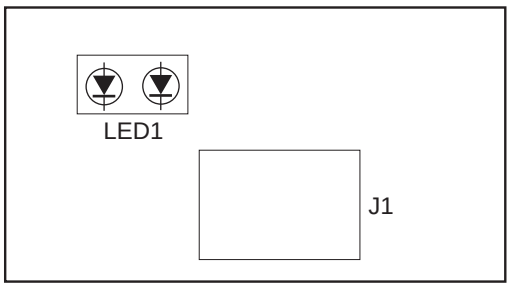

Figure 5-503

LED No.	Role
LED1	LED to be inspected by the user

Table 5-503

APPENDIX

A. SIGNAL NAMES AND CODE LIST.....A-1
B. GENERAL CIRCUIT DIAGRAM.....A-3
C. SPECIAL TOOLS.....A-5
D. LIST OF SOLVENTS AND OILS.....A-5

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A. SIGNAL NAMES AND CODE LIST

I/O Signals for Paper Deck Driver Printed circuit board

Connector	Pin	Code	I/O	Signal Name
J201	1	TXI	Input	Serial input signal
	2	GND		
	3	RXO	Output	Serial output signal
	4	CONTO	Output	Communications ready signal
	5	+24V		
	6	CKI	Input	Synch clock signal
	7	GND		
	8	GND		
	9	GND		
	10	+24V		
	11	GND		
	12	STRBI	Input	Strobe signal
	13	PWRON-IN	Input	Power-on signal
	14	GND		
	15	+24V		
J202	1	TXO	Output	Serial output signal
	2	GND		
	3	RXI	Input	Serial input signal
	4	CONTI	Input	Communications ready signal
	5	+24V		
	6	CKO	Input	Synch clock signal
	7	GND		
	8	GND		
	9	GND		
	10	+24V		
	11	GND		
	12	STRBO	Output	Strobe signal
	13	PWRON-OUT	Output	Power-on signal
	14	GND		
	15	+24V		
J203	1	+24V	Input	
	2	+24V	Input	
	3	PWRON-IN	Output	Power-on signal
	4	+5V	Input	
	5	GND		
	6	GND		
J204	1	GND		
	2	USIZE4	Input	Cassette 3 paper size detection signal
	3	USIZE3	Input	Cassette 3 paper size detection signal
	4	USIZE2	Input	Cassette 3 paper size detection signal
	5	USIZE1	Input	Cassette 3 paper size detection signal

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Connector	Pin	Code	I/O	Signal Name
J204	6	GND		
	7	LSIZE4	Input	Cassette 4 paper size detection signal
	8	LSIZE3	Input	Cassette 4 paper size detection signal
	9	LSIZE2	Input	Cassette 4 paper size detection signal
	10	LSIZE1	Input	Cassette 4 paper size detection signal
J205	1	DRVAD	Output	Motor rotation control signal
	2	DRVAND	Output	Motor rotation control signal
	3	DRVBD	Output	Motor rotation control signal
	4	DRVBND	Output	Motor rotation control signal
	5	N.C.		
J206	1	FED1AD	Output	Delivery motor rotation control signal
	2	FED1AND	Output	Delivery motor rotation control signal
	3	FED1BD	Output	Delivery motor rotation control signal
	4	FED1BND	Output	Delivery motor rotation control signal
J207	1	P5VB2	Output	
	2	GND		
	3	JAMS*	Input	Jam detection signal
	4	P5VB1	Output	
	5	GND		
	6	REGS*	Input	Registration paper detection signal
	7	+24V	Output	
	8	REGCLD*	Output	Registration roller clutch drive signal
J208	1	FED2AND	Output	Paper feed motor rotation control signal
	2	FED2AD	Output	Paper feed motor rotation control signal
	3	FED2BND	Output	Paper feed motor rotation control signal
	4	FED2BD	Output	Paper feed motor rotation control signal
	5	UDECKS*	Input	Cassette 3 Paper Out detection signal
	6	UDECKC*	Input	Cassette 3 detection signal
	7	GND		
	8	GND		
	9	PUPSLD*	Output	Paper feed solenoid drive signal
	10	LDECKC*	Input	Cassette 4 paper out detection signal
	11	LDECKS*	Input	Cassette 4 detection signal
	12	LPVS2	Input	Cassette 4 remaining paper detection signal
	13	LPVS1	Input	Cassette 4 remaining paper detection signal
	14	UPVS2	Input	Cassette 3 remaining paper detection signal
	15	UPVS1	Input	Cassette 3 remaining paper detection signal
	16	RDOORS*	Input	Delivery assembly open detection signal
	17	+24V	Output	
	18	+5V	Output	
	19	GND		
	20	GND		
J209	1	RED LED	Output	Red LED on signal
	2	GREEN LED	Output	Green LED on signal
	3	GND		

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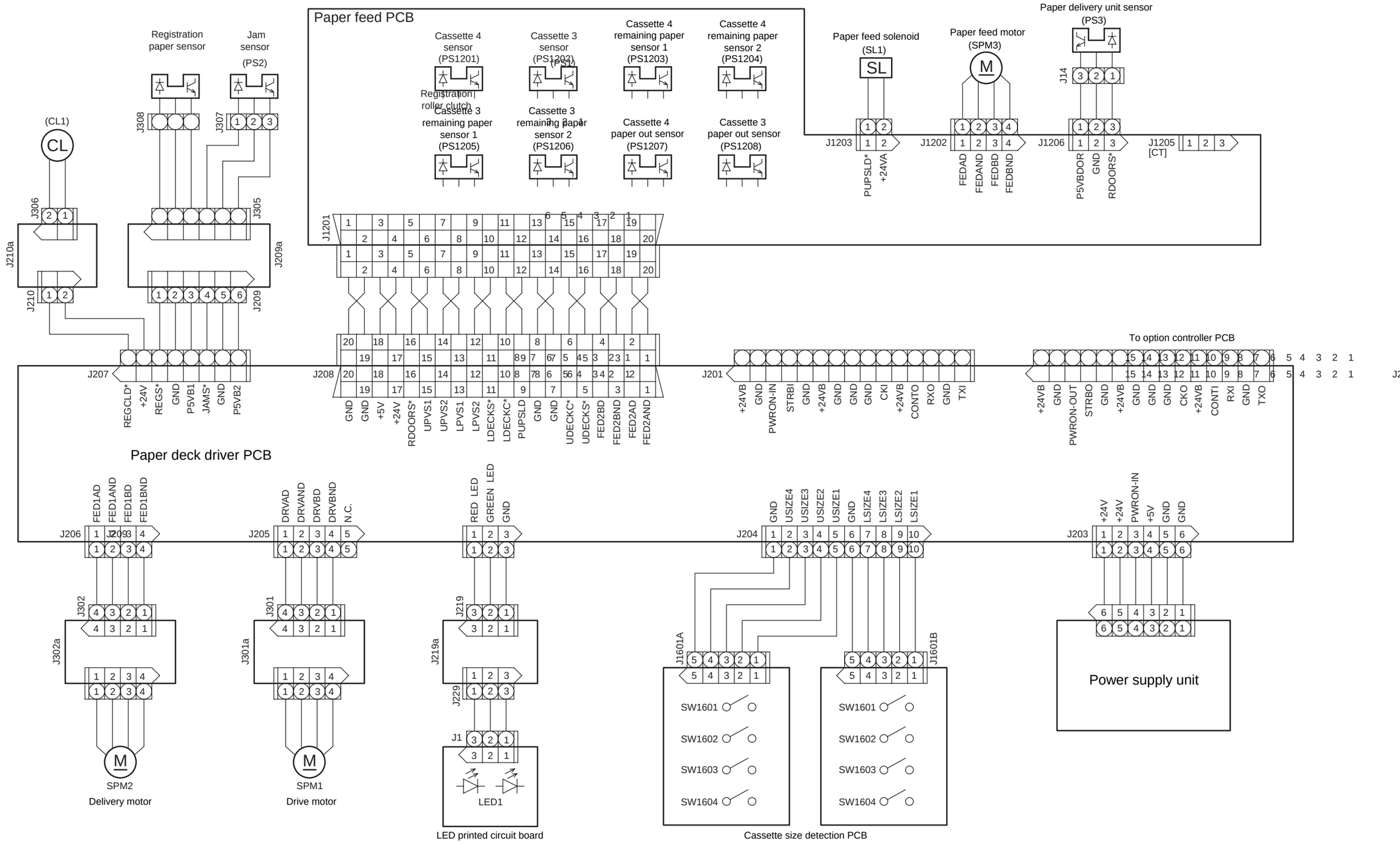
B. GENERAL CIRCUIT DIAGRAM



C. SPECIAL TOOLS

Only standard tools are required in servicing the unit.

D. LIST OF SOLVENTS AND OILS

No.	Name	Purpose	Composition	Remarks
1	Alcohol	Cleaning Example: plastics rubber, external coversApply	Fluoride carbon hydride Alcohol Surface active agent Water	• Must not be used near naked flame. • Procure locally • Substitutes: C1, IPA (isopropylene alcohol)
2	Lubrication oil	between gears and shafts	Petroleum jelly	• Terasu Oil 68 (Showa Shell Sekiyu) • Tool no.: CK8003
3	Lubricant	Apply to gears	Lithium grease	• Permalube SHV-2 (oil made in Japan) • Tool no.: CK8005

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